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Deputy Surgeon General

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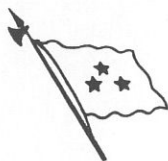
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March 3, 1973 marks the 102nd Birthday of the Navy Medical Corps. Our front cover honors VADM George M. Davis, MC, USN, the 25th Surgeon General of the Navy who retired on 31 Jan 1972 in a colorful ceremony conducted at the National Naval Medical Center (NNMC), Bethesda, Md.; and the 26th Surgeon General of the Navy, VADM Donald L. Custis, MC, USN (lower right photo). VADM Custis did not assume his official title and three-star rank until a later date, following confirmation of his appointment by the U.S. Senate.

The continued support of Ms. S.B. Hannan, BUMED Code 2133, and the Illustration and Exhibits and Photography Divisions of the Medical Graphic Arts Dept., Naval Medical Training Institute, NNMC, Bethesda, Md., is gratefully acknowledged.



THE SURGEON GENERAL OF THE NAVY

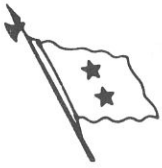
TO THE OFFICERS OF THE MEDICAL CORPS

On the 3rd of March we will celebrate the 102nd Anniversary of the formal establishment of the Medical Corps by the Congress. Since 1871 the practice of naval medicine, as we all know, has advanced considerably as our Navy grew larger, with greater commitments throughout the world and more sophisticated systems to meet these commitments.

Yet our primary responsibility - to provide the best possible health care to our sailors and marines, and their families - has not changed and this responsibility is the challenge of the decade as we search for new methods to provide this care both more effectively and more efficiently. In the final analysis no system, no organization, and no plan can be more effective or efficient than the people who make it work. I know that I can continue to rely on your skill, your knowledge, and your judgement as we seek to make the Medical Department more responsive to the needs of both our patients and our personnel.

The challenge is before us and we must meet it with the same devotion to duty and dedicated professionalism that has marked the performance of Medical Corps officers throughout our history. I know we can. Happy Birthday.

D. L. CUSTIS
Vice Admiral, MC, USN



DEPARTMENT OF THE NAVY
ASSISTANT CHIEF OF THE BUREAU OF MEDICINE AND SURGERY FOR DENTISTRY
AND
CHIEF OF THE DENTAL DIVISION
WASHINGTON, D. C. 20390

TO THE OFFICERS OF THE MEDICAL CORPS

I am proud to extend greetings and hearty congratulations to each of you from the officers of the Navy Dental Corps on the occasion of the 102nd Anniversary of your Corps.

The past year, as throughout the history of the Navy Medical Corps, you have met new challenges and set new goals. With signal devotion to duty, you provided medical care of the highest standards for all those who look to you for the preservation of that most important asset, one's health.

I know you will continue in the coming year to provide with dedication the best medical care to the finest Navy in the world.

J. P. Arthur
J. P. ARTHUR
Rear Admiral, DC, USN



DEPARTMENT OF THE NAVY
CHIEF OF THE MEDICAL SERVICE CORPS
BUREAU OF MEDICINE AND SURGERY
WASHINGTON, D. C. 20390



TO THE OFFICERS OF THE MEDICAL CORPS

Speaking for the officers of the Medical Service Corps, hearty congratulations on this one hundred and second Anniversary of the establishment of the Navy Medical Corps.

The impressive record of accomplishments, both individually and collectively, fully justifies the fine reputation enjoyed

by the Medical Corps throughout the Naval Establishment. We are proud to be a component of this very fine Medical Department and to be able to complement the functions of your Corps in service. We dedicate ever increasing efforts in assisting in the performance of your mission.

A Happy 102nd Birthday to the Medical Corps!


E. L. VAN LANNINGHAM, JR.
Captain, MSC, USN



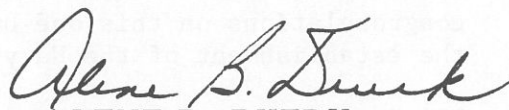
DEPARTMENT OF THE NAVY
DIRECTOR NAVY NURSE CORPS
WASHINGTON, D. C. 20390

TO THE OFFICERS OF THE MEDICAL CORPS

On this, the occasion of your One Hundredth and Second Anniversary, it is a pleasure for the officers of the Navy Nurse Corps to send greetings and to express our heartfelt congratulations to members of the Navy Medical Corps.

Today, as Navy medicine faces many new and challenging innovations in health care delivery, your illustrious history of dedicated service and professional progress will serve as inspirations as you endeavor to further enhance and expand your chosen profession.

All members of the Navy Nurse Corps join with me in expressing the pride which we feel in our association with you; and on this anniversary, we salute you, extend our best wishes for the future, and we stand ready to give our full and continued support to you in the fulfillment of the mission of the Navy Medical Department.


ALENE B. DUERK
Rear Admiral, NC, USN

about the Chief



The President has nominated RADM Donald L. Custis, MC, USN as the 26th Surgeon General of the U.S. Navy. As we go to press, Senate confirmation of Admiral Custis' nomination to three-star rank is anticipated.

Dr. Custis was born in Goshen, Ind., on 23 Jul 1917, son of the late Lauren A. Custis and Mrs. Margaret (Shannon) Custis. He received his BA degree (Sciences) at Wabash College at Crawfordsville, Ind., in 1939 and earned the degree of Doctor of Medicine from Northwestern University Medical School, Chicago, Ill., in 1943. Internship was served at Presbyterian Hospital in Chicago, Ill. Appointed to the Medical Corps in the U.S. Navy on 11 Jun 1944 with the accompanying rank of LT(jg), MC, USNR, he subsequently advanced in rank to that of RADM, MC, USN, to date from 1 Jul 1972; Senate confirmation of his nomination to three-star rank is awaited momentarily.

Ordered first to the attack transport ship USS *Clinton* (APA 144), he served there from 1944 until 1946 when he was released to the inactive Naval Reserve.

He returned to active duty in Oct 1956 and was a medical officer in the Surgical Service at the Naval Hospital, Portsmouth, Va., until Jun 1958. He served as the Chief of the Surgical Service at the Naval Hospital, Guantanamo Bay, Cuba from Jul 1958 to Jul 1960; Assistant Chief of the Surgical Service at the Naval Hospital, Great Lakes, Ill., from Aug 1960 to Feb 1963; and Chief of the Surgical Service at the Naval Hospital, Beaufort, S.C. and Philadelphia, Pa., from Mar 1963 to Jul 1965 and Jul 1965 to Sept 1967, respectively. In Sept 1967 he was assigned as the Executive Officer of the Naval Hospital, Philadelphia, where he remained until May 1969.

On detachment from Philadelphia, he reported to the Naval Support Activity, DaNang, Republic of Vietnam as the Head of the Medical Department through May of 1970. In Jul 1970 he reported to the Naval Hospital, Bethesda, Md., as the Commanding Officer of that facility and the Deputy Commanding Officer of the National Naval Medical Center.

Admiral Custis is a Diplomate, American Board of General Surgery and a Fellow of the American College of Surgeons.

In addition to the Legion of Merit with Combat V and the Combat Action Ribbon, Admiral Custis has the Navy Unit Commendation with 1 star; Meritorious Unit Commendation; Vietnam Cross of Gallantry; American Campaign Medal; Asiatic-Pacific Campaign Medal; World War II Victory Medal; Navy Occupation Service Medal - Asia Clasp; China Service Medal; Vietnam Service Medal and the Navy Expeditionary Force Medal.

We cannot improve upon the introduction which VADM G.M. Davis, the 25th Surgeon General of the Navy, extended to his successor: "... Doctor Custis' distinguished career in naval medicine well qualifies him to assume his new and important duties. Under his capable guidance and with our dedicated and loyal support, I know that the Medical Department of the Navy will continue to remain responsive to the needs of those we serve." 🌿

the Deputy Chief



Harry Stough Etter was born in Shippensburg, Pa., on 15 Oct 1915, son of Dr. Harry Blaine Etter and Mrs. Helen Augusta (Stough) Etter. As an undergraduate student he attended Duke University, Durham, N.C. and in 1939 received the degree of Doctor of Medicine from the Medical School of that University. On 1 Jan 1940, he began his internship at Bellevue Hospital, New York, and on 2 Jul 1940 was appointed as Acting Assistant Surgeon for intern training. Commissioned Assistant Surgeon, with the accompanying rank of LT(jg) in the U.S. Navy on 20 Mar 1941, he subsequently advanced in rank in the Medical Corps to that of RADM, to date from 1 Jan 1967.

After receiving his appointment in 1940, he interned at the Naval Hospital, Portsmouth, Va., until April 1941, after which he had instruction at the Naval Medical School, Washington, D.C. In July 1941 he joined the Staff of Commander Destroyer Division FOURTEEN as Division Medical Officer, and for a year, Jan 1942 to Jan 1943, he served as Medical Officer of the USS *Madison* (DD-425), which operated as a unit of Destroyer Division FOURTEEN performing convoy and patrolling duty in North Atlantic waters during the early months of World War II.

Detached from the *Madison*, he had postgraduate instruction at the Mayo Clinic, Rochester, Minn., and in Sept 1943, reported as Chief of the Physical Medical and Rehabilitation Department at the U.S. Naval Hospital, Bethesda, Md. He remained there until Sept 1945 and the next month was assigned to the Physical Medical Division, Bureau of Medicine and Surgery (BUMED), Navy Department, Washington, D.C. He was an instructor in Atomic, Biological and Chemical Defense at Treasure Island, San Francisco, between Jan 1948 and Jul 1951, when he returned to BUMED for duty as Head of Atomic Defense. He continued to serve in that capacity until 1 May 1954, when he assumed the duties of Director of the Special Weapons Defense Division.

In Aug 1955, he reported for instruction at the Naval War College, Newport, R.I., and after completing the Naval Warfare and Senior Courses, had duty from Aug 1956 until Jun 1959 on the Staff of the Commander in Chief, U.S. Pacific Fleet. He next served as Medical Director at the Naval Radiological Defense Laboratory, Naval Base, San Francisco, and while there was also Assistant Director for Biomedical Research. In Aug 1961, he returned to BUMED as Director of the Planning Division. In Feb 1965, he became Executive Officer of the Naval Hospital, Portsmouth, Va., and in Jun 1966, assumed command of the Naval Hospital, Bethesda, Md.

In Jul 1967, Admiral Etter was assigned as Assistant Chief for Planning and Logistics, BUMED and on 1 Mar 1973, assumed the position of Deputy Surgeon General of the Navy.

Admiral Etter has the American Defense Service Medal; American Campaign Medal; World War II Victory Medal; the National Defense Service Medal, and the Legion of Merit.

His selection for the high office of Deputy Surgeon General of the Navy is regarded with great satisfaction and pleasure by many friends and admirers. 🍀

RAdm Allerittain, Adieu



When I retire on 1 March 1973, I can honestly say that I shall leave the naval service with two strong personal feelings. The first is one of pride. I am proud to have had the opportunity to know and serve with so many fine members of the Navy Medical Team. In the over thirty years since I first became a Medical Corps officer I have served at a variety of duty stations, under a variety of conditions, and with a broad range of responsibilities. I must admit that there were times when I had considerable difficulty working within the Navy system, particularly in the early days of my career, and the reason that I did manage to do so was because the interest, the enthusiasm, and the professionalism of those with whom I had the privilege of working carried me through those rough days when I couldn't see the woods for the trees.

The strength of our Navy health care system is, always has been, and always will be, our people. I am well aware that our system has changed, as it must if we are to meet our commitments in this modern Navy. But I am positive that no matter how complex or how sophisticated our health care system becomes, the people who make it work will exhibit the same dedication to professionalism and devotion to duty as those who have helped me all through my career; and I am proud to have been part of their team.

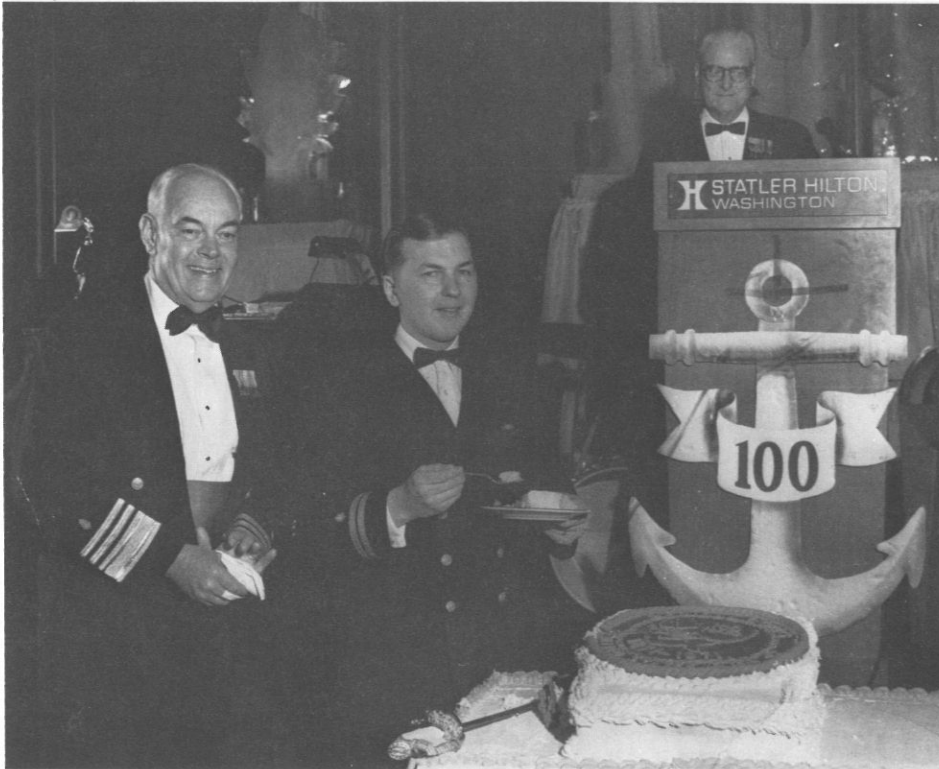
The second feeling I have as my career draws to a close is one of sadness. I am sad for two reasons. The first is because, quite honestly, I shall miss my friends, my colleagues, and all the camaraderie that comes with being a part of a great organization like the Navy Medical Department. The second reason is because I shall miss the opportunities and the challenges that will come during this decade as we seek ways to make our health care system more responsive, while at the same time we seek to meet the whole new range of commitments that have, and will continue to come in this age of space and undersea exploration. How exciting, how professionally satisfying, and how personally pleasing it would be, to be starting my career in 1973 rather than seeing it come to an end; I envy your opportunity to be a part of the Navy of the 1980's and beyond.

And so, as my career draws to a close, I feel both proud and sad. But thanks to you, and to those who have served before you during the past thirty-three years, I shall always have fond memories of the time that I was a part of the great team we call the Navy Medical Department. CARRY ON!



Visiting USS SANCTUARY on station, off coast of Vietnam.





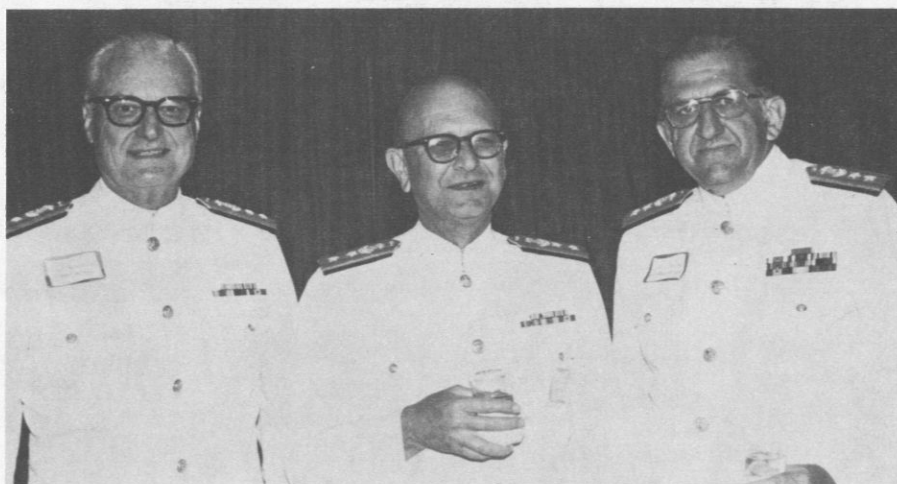
Master of Ceremonies at the gala 100th Anniversary Ball of the Navy Medical Corps held in Washington, D.C. on 5 Mar 1971.



Socializing during evening hours at the Command and Staff Seminar held in March 1971.



Groundbreaking Ceremony for the new hospital at Camp Pendleton in May 1971.



Presenting the Legion of Merit award for the President at a retirement ceremony for CAPT Robert M. Tennille, Jr., MSC, USN.



Awarded the Legion of Merit for demonstrated "exemplary leadership, exceptional managerial ability and superb professional competence as a physician." As Deputy Surgeon General from Feb 1969 to Mar 1973, RADM Albrightain was responsible for coordinating the efforts of some 49,000 personnel, who provide medical care to over two and one-half million active duty and retired Navy and Marine Corps personnel and their families. 🌿

Dr. Joseph Harrison: America's First Naval Surgeon

By LCDR Robert R.M. Gifford, MC, USNR,
Naval Hospital, Charleston, South Carolina.

For the past few years, congratulatory birthday messages to the U.S. Navy Medical Corps have proudly referred to the time when "the first naval surgeon went to sea," but did not specifically name Dr. Joseph Harrison as the man who held this honor.^{1,2*} Except for this singular event, Harrison left little mark on American medical or naval history. Following many months of search through available records of the Revolutionary Period, both medical and Naval, in state and national libraries, this relatively brief sketch of Dr. Joseph Harrison has been compiled.

Early Life

Joseph Harrison was born into a Quaker family between the years 1740-1750. His immigrant father, also named Joseph Harrison, had received a 200-acre tract of land by proprietary warrant in 1737 from Thomas Penn, son of the noted William Penn.³ This land was located near Great Neck in the county of Kent, Delaware. Approximately one year later, the marriage of Joseph Harrison and Rhoda Long took place; the

birth of the future naval surgeon followed almost ten years later.⁴

From the time of his birth to his participation in the Revolutionary War, Harrison's life was historically obscure. Apparently he learned medicine from a local physician by apprenticeship, for there is no record of his having graduated from any of the formal medical school training programs of that period, prior to the beginning of the Revolution.⁵

Revolutionary War Period

With the beginning of hostilities at Lexington and Concord in April, 1775, the Continental Congress was faced not only with the formidable task of raising an army with adequate supply systems, but also the imposing British blockade along the eastern coast. If the blockade could be broken, vital support from allies on the European continent would become accessible. It was for this immediate purpose that the first Continental Navy was formed.

In late 1775 Esek Hopkins of Providence, Rhode Island, was given the responsibility of organizing the first American naval fleet. He soon acquired six merchant vessels of varying size and brought them to Philadelphia for conversion to effective men-of-war. These vessels were named the *Alfred*, *Andrew Doria*,

*A notable exception: From the Chief (VADM G.M. Davis, MC, USN). U.S. Nav Med 55(2):2, Feb 1970.—Ed.

The assertions and opinions contained herein are those of the author and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Cabot, Providence, Columbus and Hornet. While the *Alfred* was the largest, being 350 tons and carrying 30 guns on two decks, the other ships (in the order named) were progressively smaller, respectively; the *Hornet* was but a light schooner of only eight guns.^{6*}

The crew for these ships originated primarily from "the Capes of the Delaware," and numbered almost 900. Among the officers in the *Alfred*, Dr. Joseph Harrison was listed as the surgeon of the fleet.⁷ Other than this mention of his name in the ship's log, no other information about Harrison's activities during this period has been uncovered. (See Figure 1)

Also aboard the *Alfred* was a young first lieutenant named John Paul Jones. When the fleet sailed from Philadelphia in February of 1776, Jones had the privilege of raising the first American flags to be flown by an American man-of-war. One flag, the famous "Don't Tread On Me" navy jack, bore a serpent superimposed upon a field of horizontal red and white stripes.⁸

*According to the Division of Naval History's "American Naval Fighting Ships," (1968), the *HORNET* carried ten nine-pounders.

The lot of the physician in our early Navy was hard, and one may wonder what inducements attracted men to become naval surgeons, to endure hardships at a salary of \$25 per month with little social or professional recognition. There were several considerations. Chief among these was the lure of the sea, travel and adventure. Surgeons and surgeon's mates were mostly young men, just entering upon their medical careers; in colonial times, gaining a foothold in civilian practice was no easy matter. The war posed an additional complication. Although the remuneration was small, at least it was sure and steady. Then there was the prize money. By an Act of Congress, 1776, all members of the ship's crew received a share of the bounty when an enemy vessel was captured. Another attraction was the probability of acquiring an extensive surgical experience in trauma, in a relatively short time. When not at sea, the young naval surgeon could look forward to visiting established surgical clinics along the eastern coast and on the continent.⁹

Whatever his motivations, Dr. Harrison sailed as the only known surgeon with the first Continental Navy in 1776. Originally, the fleet was to seek out and engage

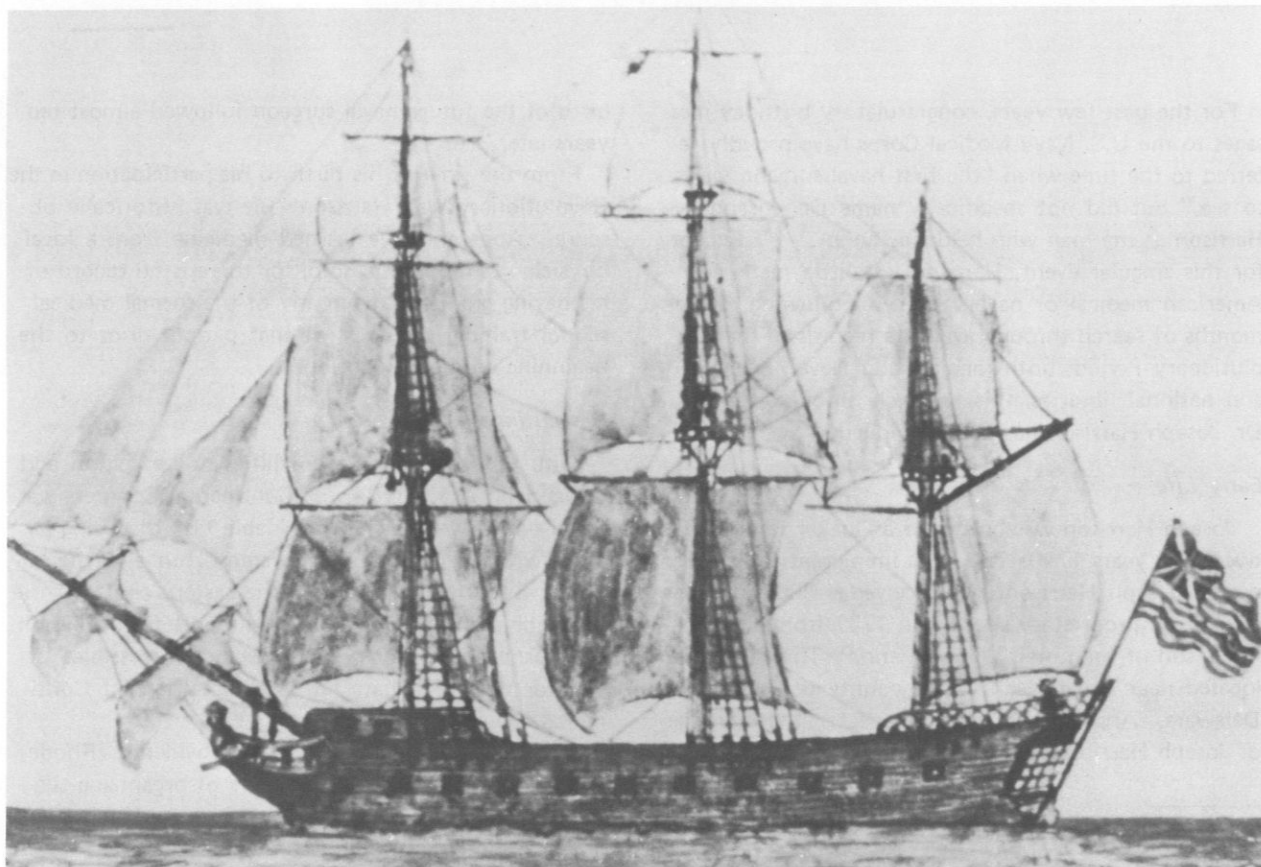


Figure 1.—USS ALFRED (1775-1778). The above photograph of a watercolor painting by an unidentified artist was kindly provided by The Division of Naval History and the Naval Photographic Center, Naval Station, Washington, D.C.

Admiral Donnelson's British forces along the coast of Virginia. But after several delays as a result of ice formation in the Chesapeake Bay, Commodore Hopkins grew anxious for quicker and bigger victories. Based on rumor that large stores of gunpowder were hidden on New Providence Island, he sailed for Nassau in the Bahamas.¹⁰ Shortly after the fleet's arrival in early March, the outgunned British garrison surrendered and relinquished far less powder stores than the Americans had expected.¹¹

For Dr. Harrison the journey back to New England was troubled both by disappointment and significant health problems. Apparently the landing parties which had gone ashore at New Providence had returned with a communicable illness, manifested by high fever and delirium. In a letter to John Hancock, Commodore Hopkins later described the sickness as "some new malignant fever."¹² No record was apparently made of Dr. Harrison's efforts or his clinical impressions. The toll was evidently staggering for upon return to New London River, Conn., six weeks after departing from the Bahamas, Dr. Harrison was forced to off-load 202 patients out of a total of 900 men on the six ships. At least a score succumbed in transit.¹³

Other problems further beset the first fleet of the Continental Navy. Two of the captains were court-martialed for refusing to attack the HMS *Glasgow* off the Rhode Island coast in April, 1776. Because of failure to carry out his original orders and the disappointing performance of the fleet in the Bahamas, the Continental Congress relieved Commodore Hopkins of his command. John Paul Jones, by then a distinguished line officer, was advanced to assume command of the *Alfred*. In fact, these six ships that comprised the first Continental Navy never again sailed together as a fleet.¹⁴

With the dissolution of the fleet in May of 1776, Dr. Harrison presumably left the *Alfred*, for no further mention of his name appears on the ship's roster nor in the later papers of John Paul Jones.^{15,16} Thus, Dr. Harrison falls again into historical obscurity until September of 1777, when he is found to be present among the physicians at the Continental Army Hospital in Bethlehem, Pa.¹⁷

One can only speculate on Dr. Harrison's movements during this 16-month period. About the time when Dr. Harrison presumably left the fleet in New London, Conn., General Washington was preparing his troops on Long Island for the New York Campaign. It is quite possible that Dr. Harrison learned of this upcoming action, made the short 40-mile trip across Long Island Sound to join Washington's forces, and subsequently remained with the Continental Army. Building on

this assumption, Dr. Harrison can be logically traced to Bethlehem, Pa., in September of 1777.

Following the disastrous defeat of Long Island, Washington had retreated into New Jersey during December of 1776. Two brief victories at Trenton and Morristown provided for the colonists some vital encouragement. The Philadelphia Campaign commenced in the late spring, with the promise of blocking General Howe's British forces that were moving south. The ensuing battles of Brandywine and Red Bank left in their wake at least 1000 sick and wounded Americans at Morristown, N.J. Because of the tenuous military situation, it was decided to move the General Hospital of the Continental Army to Bethlehem, Pa.¹⁸

During the colonial period the town of Bethlehem was almost entirely populated by Moravians, a peaceful, religious, neutral sect. A military hospital had been located in the town in December of 1776, when approximately 300 sick and wounded were quartered there during the New Jersey Campaign. (See Figure 2) The brotherhood of Moravian clergy were especially charitable and unselfish in helping the Continental Army surgeons and surgeon's mates at a time when communicable diseases claimed more victims than did the complications of battle wounds.

Dr. Joseph Harrison was apparently one of the four surgeons who arrived in Bethlehem in September of 1777, with an initial contingent of patients. In late October additional surgeons began to arrive with the wounded from the battlefield at Germantown. The patient census rose to 400, and many were confined to small tents which offered inadequate protection from the elements. The doctors promptly announced they could handle no more.

Nevertheless, orders from the Medical Department advised them to prepare for another 100 patients. By December the total number of patients was in excess of 700. Ventilation was poor, food and clothing scarce, and sanitation inadequate. Soon cases of "putrid fever" presented which marked the onset of a typhus epidemic.¹⁹ The number of deaths was staggering, having reached the 500-mark in three weeks.²⁰

The fever also took its toll of the hospital staff. No orderlies or nurses were reported to have survived the Bethlehem Hospital epidemic.²¹ One of the hospital's surgeons, Dr. William Smith, gave this account:

... that he had known from four to five patients to die on the same straw before it was changed, and that many of them had been admitted only for slight disorders. Of the eleven junior surgeons and mates, ten took the infection, most of them dangerously so, and two, Dr. Aquila Wilmot and Dr. Joseph Harrison, had died.²²



Brethren's House Bethlehem

Figure 2.—Currently known as the Colonial Hall of Moravian College, Brethren's House was used as a hospital by the Continental Army surgeons through the courtesy of the Moravian Church, in Bethlehem, Pa. (This sketch was taken from The Army Medical Bulletin Number 25, "Medical Men in the American Revolution 1775-1783," by LTCOL Louis C. Duncan, AUS [Ret.], page 172, Medical Field Service School, Carlisle Barracks, Pa., 1931.)

Epilogue

Following his death in late December of 1777, Dr. Harrison was buried in the "Stranger's Row" of the Moravian Cemetery in Bethlehem, Pa. For some reason, he had not maintained close contact with his family in Delaware. It is conceivable that his whereabouts and demise during the Revolutionary War were not made known to the family for some time. In 1832, Dr. Harrison's modest estate was finally settled, his heirs receiving a total of \$67.25.²³

From the noticeable paucity of correspondence, public records and historical accounts concerning Dr. Joseph Harrison, one may surmise that he was a quiet man who went about his practice of medicine unpretentiously. He seemed always to be surrounded by obscurity, controversy and adversity. Were it not for his untimely death, posterity might have come to claim him as one of great distinction. One senses, somehow, a plaintive regret that he could not be spared, to realize fully the proud significance of having been America's first naval surgeon.

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Discussion

While some may dispute whether Dr. Harrison was actually the "first" Navy Surgeon, he was certainly among the first to sail in a vessel authorized by the Continental Congress.

There may well be some who will contend that Dr. Benjamin Rush was the first Naval surgeon, having been in charge of a makeshift hospital situated on Province Island in the Delaware River at Philadelphia for some time during the spring and summer of 1775. The facility had been used by the British before the war began. During that same season, a Dr. Samuel Duffield was also in attendance at the hospital.¹

Dr. Gifford cites the Hopkins' Fleet as the first American Navy Unit, which was in fact not ready for action before Feb 1776. It should be pointed out that earlier, in Aug 1775, GEN Washington acted under general authority (granted by Congress) as Commander-in-Chief, creating a small Continental Naval Force. The General outfitted the schooner HANNAH, among others, at Continental expense; the officers and men of Washington's Fleet were from the Army. HANNAH

put to sea on 5 Sept 1775, participating in military operations during the siege of Boston and local cruises. There is no available evidence that any Surgeons embarked in Washington's Fleet.²

It is known that ANDREW DORIA of Hopkins' Fleet carried one Surgeon Thomas Kerr. Others, not known to us, may have served in the other vessels.

As suggested by Dr. Gifford, it is probably not remarkable that Dr. Harrison followed his service in ALFRED by service in the Continental Army. Probably many men had dual service. Duncan³ lists the Dr. Harrison who served at the Bethlehem hospital as having come from Virginia in one place, and from Pennsylvania in another place.

Since the formality of issuing commissions was not always followed in those days, it is possible that several physicians had service in 1775, antedating or contemporaneous with that of Dr. Harrison. It is also possible that he served as a surgeon's mate in view of his apparent lack of formal medical education, and the fact that ALFRED was a relatively small ship (listed at 200 tons, complement 235, 20 nine-pounders and ten six-pounders).²

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DIPLOMATES IN CLINICAL PSYCHOLOGY

Two psychologists on active duty in the U.S. Navy have been certified by the American Board of Professional Psychology.

LCDR Loren D. Acord, MSC, USN and LCDR John G. Jones, MSC, USNR are the first two psychologists ever to receive board certification while on active duty in the U.S. Navy.

LCDR Acord is a clinical psychologist on the staff at Naval Hospital, NNMCMC, Bethesda, Md.

LCDR Jones graduated from Hardin-Simmons University at Abilene, Tex., received his MA degree from Texas Tech University and his Ph.D. degree from the Univ. of Wisconsin. He has taken internships in both counseling and clinical psychology, and is a member of the Neuropsychiatry Dept. at the Naval Aerospace Medical Institute. 🍀

Shipboard Medical Readiness

By LCDR William A. Dewey, MSC, USN,*
Marine Corps Command and Staff College,
Marine Corps Base, Quantico, Virginia.

After spending three years on ship inspection as a member of the Fleet Training Group (FTG) at Guantanamo Bay, I have formed the opinion that our medical departments aboard ship are not maintained in the optimal state of readiness for war. The lack of medical preparation for war occurs in spite of guidance provided by the MANUAL OF THE MEDICAL DEPARTMENT, directives and Type Commander Shipboard Medical Guides. Directives alone are not enough to maintain our medical departments in an acceptable state of readiness.

How do we improve? The answer lies in improved training and standardization.

Every week, two or three ships arrive at the Fleet Training Group, Guantanamo Bay to commence their underway training cycle. Individual personnel training has been conducted at shore schools back in the U.S. and now is the time for team work. The purpose of underway training is to teach individual teams to work

together, to coordinate their efforts in support of ship operations, emergencies and battle conditions.

Training Readiness Evaluation

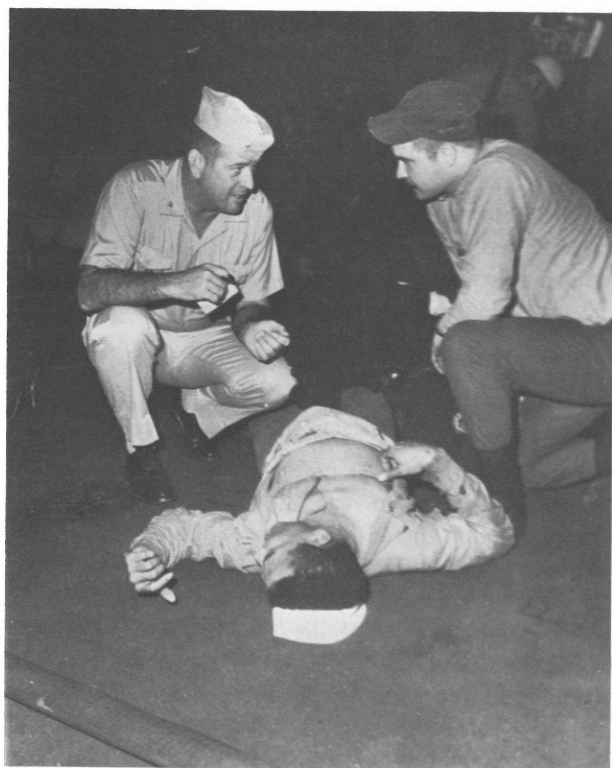
The first step after a ship arrives in the Fleet Training Group is to determine if it is ready to begin team training. That is the purpose of a Training Readiness Evaluation. Among medical departments, the greatest deficiency encountered in a consideration of readiness to commence training is the lack of experience. It is very common to be greeted on the gangway by the ship's hospital corpsman and to find that this is his first ship. His previous sea duty has been with the Fleet Marine Force or at an overseas shore station. The sick bay is found to be neat, clean, and well-stocked. The adequacy of medical facilities outside the sick bay, however, is marginal. The medical department representative simply does not know what is expected of him.

Training

Training is the obvious solution to improve our readiness posture, but it cannot be provided in our schools until standardization has been achieved. At present there are more than a dozen different "Shipboard Medical Guides" that the schools would have to incorporate

*LCDR Dewey was formerly a staff member of the Medical Training Department of Fleet Training Group, Guantanamo Bay, Cuba.

The opinions or assertions expressed in the above article are those of the author and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.



UNDERWAY TRAINING — After each surprise first-aid drill conducted during underway training, a member of the Medical Training Department of Fleet Training Group, Guantanamo Bay, Cuba, conducts a review of the drill.

in their curriculum. Each Type Commander, COMNAVAIRLANT, COMNAVAIRPAC, COMPHIBLANT, COMPHIBPAC, COMCRUDESANT, COMCRUDES-PAC, etc., promulgates his own shipboard medical guide. These guides are a necessity and must be maintained, but our schools cannot realistically utilize them as a basis for instruction until they become more uniform and consistent in their chapters on emergency preparations and training.

When Seaman Jones takes the examination for petty officer third class, in any rating except HM3 or DT3, he must address five to fifteen questions on first aid. These questions are derived from his qualification manual, the Standard First-Aid Training Course, NAVPERS 10081-B. If any other publication is being referenced in first-aid lesson plans for non-medical personnel, such as the HANDBOOK FOR HOSPITAL CORPSMEN or training courses for hospital corpsmen, then all of the seamen trying to make a rate are being inequitably graded. Check any number of first-aid publications for the recommended frequency of mouth-to-mouth resuscitation cycles per minute, for example. Almost all vary sufficiently to preclude the likelihood that Seaman Jones will answer a multiple-choice question successfully.

In their Shipboard Medical Guides, all Type Commanders specify the subjects that are to be taught to non-medical personnel by the ship's hospital corpsman. In most cases the SYLLABUS OF LESSON PLANS FOR FIRST-AID INSTRUCTORS, former NAVMED P-5056 is used as a guide. This is an outdated publication which was eliminated in Aug 1968; however, it has been retained as a required publication in several Shipboard Medical Guides and medical department administrative inspection check-off lists. A few of our Type Commanders recommend use of the STANDARD FIRST-AID TRAINING COURSE, NAVPERS 10081-B for training non-medical personnel. A new system called the Personnel Qualification System is in effect on a number of ships in the Navy. In the Personnel Qualification System, lessons to be taught non-medical personnel are specified in *paragraph 2103, Personnel Qualification Standard for Damage Control, Section II* NAVPERS 94119-2. Although I consider that this publication is deficient because of use of a reference other than the Standard First-Aid Training Course and the absence of a required lesson on the contents of the shipboard first-aid box, nevertheless the Personnel Qualification System is an excellent one and I hope it will be incorporated in the Shipboard Medical Guides.

Standardization

Let us consider the need for standardization of the contents of first-aid boxes, medical lockers, and battle dressing stations. Why should a man who has transferred from a LANTFLT destroyer to PACFLT destroyer, or an aircraft carrier, have to learn the contents of a first-aid box all over again when that knowledge should have been carried with him from the LANTFLT destroyer? The inventories and internal storage requirements for all first-aid boxes should be the same throughout the Navy. Every drawer in the standard battle dressing station cabinet should be numbered, and the contents should be the same wherever it is used aboard ship. Suppose a medical officer is helo-lifted from his own ship to a ship belonging to another Type Commander. Standard knowledge of what he has to work with, and exactly where it is stored, will surely save time; it could also save life.

Every new ship coming into the Navy does not receive sufficient medical supplies in its initial outfitting to stock its first-aid boxes, medical locker and battle dressing stations because of different requirements stipulated by Type Commanders. As a result of personnel reductions, the hospital corpsman is no longer a member of the precommissioning crew. Accordingly these supplies are not ordered until the corpsman has reported aboard, read his SHIPBOARD MEDICAL

GUIDE and discovered his deficiencies. Under the present funding system, furthermore, the ship's corpsman cannot order these supplies until the ship has been commissioned and expenditures against the medical open-allotment are authorized.

It is months after commissioning before a ship is ready for war from a medical material standpoint. Under the present system of funding, the Fleet has to provide the money because the ship's hospital corpsman exceeds his annual authorization by \$2,000 — \$3,000. Think about it. Standardization of first-aid boxes, medical lockers and battle dressing stations would eliminate the greatest gripe of the Fleet Surgeon and corpsmen putting a new ship into commission. It appears to me that this standardization could be accomplished in SHIPBOARD MEDICAL GUIDES and AUTHORIZED MEDICAL ALLOWANCE LISTS.

Institution of the above changes could result in improved standardized training of our corpsmen in shore schools and a well-stocked, battle-ready ship.

It's time we went aboard. Do we need more help? You bet we do. Keeping the ship afloat and fighting is more important than any personnel casualty. A casualty must be given first aid on the scene during battle. The injury must be reported to Damage Control Central and stretcher-bearers requested. During battle, corpsmen don't make house calls. They are not permitted, for any reason, to leave their general quarters station. The injured must be brought to battle dressing stations by trained stretcher-bearers.

Coordination

In today's undermanned Navy, the battle dressing stations do not have four stretcher-bearers and a phone talker assigned. Four men in each repair party are assigned additional duty as stretcher-bearers. Two prerequisites for assignment are strength and intelligence. When a stretcher team arrives on the scene of an injury, they should immediately relieve the on-scene personnel of first-aid responsibilities and let them get back to the business of fighting the enemy. Stretcher-bearers must have advanced training to intelligently and rapidly evaluate a casualty, treat him, and safely move him. While three men of the stretcher team treat the casualty and place him in the stretcher, the fourth man goes to the nearest phone talker, relays the injury report to Damage Control Central, and requests a safe route.

The Damage Control Assistant is the only man aboard the ship who knows what types of casualties are presently at each battle dressing station. The Damage Control Assistant tries to guard against casualty overloads, and he knows where all damage to the ship

is located. Without the necessary direction from the Damage Control Assistant, stretcher-bearers could readily take the casualty to the wrong battle dressing station, come upon a ladder that has been blown away, go through a compartment with a fire under it, or open a hatch to a flooded compartment. This is an essential aspect of the team training which stretcher-bearers receive at FTG — the importance of the Medical Department, Repair Party Stretcher-Bearers, and Damage Control Central, all working together.

Recommendations

I should like to submit two recommendations, regarding portable medical lockers and stretchers to improve this system. At present, one portable medical locker is installed for each 200 accommodations or major fraction thereof. However, ships with a medical department representative and less than 200 accommodations are provided with a minimum of two lockers. This requirement is specified in GENERAL SPECIFICATIONS FOR SHIPS OF THE U.S. NAVY. I would like to see this altered to require one portable medical locker for every repair party aboard ship. It should be the responsibility of the Repair Party Officer to stow it and automatically transport it to the scene of multiple injuries within his area of responsibility. The ship's medical department should be required to make an inventory of it every 30 days, forwarding a written report to the Repair Party Officer and Commanding Officer.

Recommendations regarding stretchers are based on the opinion that the Neil-Robertson stretcher is too complicated for general use. I would issue a Neil-Robertson stretcher to the senior bearer in each team and make him responsible for it. About 15 feet of 21-thread Manila line should be attached on each end prior to issue. Manila line is used because it doesn't get slick when wet, as nylon line does. The 21-thread size is used not only because of strength, but also because it is the proper hand size.

Neil-Robertson stretchers should be mounted above the uppermost hatch of each escape trunk, with sufficient line attached to lay the stretcher on the bottom deck and reach through the top hatch, leaving a surplus of about 10 feet of line. Each ship should have a stretcher on its uppermost deck, usually the signal bridge. Enough line should be attached to allow for a man to be lowered to the main deck in the event that ladders are blown away.

A Neil-Robertson stretcher should never be mounted in an engine space. The heat and humidity rot the stretcher, and the very incident that created the casualties — an explosion, fire, or steam leak for example — may have destroyed the stretcher previously mounted in



REVIEW AT SEA — The author is shown reviewing a first-aid drill in USS America.

the space. I also recommend that the medical department on each aircraft carrier maintain its own block and tackle in tip-top shape. On aircraft carriers casualties may have to be lifted on stretchers through six levels. The block and tackle maintained in the repair party locker is not always available or fit.

In a review of Shipboard Medical Guides, it is noted that some establish a requirement for *Supplemental Items* to the *Gas Casualty Treatment Set*. I believe a more appropriate title would be *Supplemental Items to the Decontamination Station*. These items should be stowed in a permanently mounted box near the showers of the decontamination station. Their purpose is not only for use in decontamination of gas casualties but also for treatment of nuclear and biological casualties. These items are critical and should be stowed in the primary and alternate decontamination stations. The six critical items are: soap, scrub brushes, ear syringes, eye baths, nail clippers and hair clippers. A man from the local repair party manning the decontamination

station should be assigned to issue these items, as needed, instead of a hospital corpsman.

I have one final recommendation for corpsmen aboard ship. In peacetime, a corpsman should never stay at his battle station during general quarters. Permission should be obtained from the commanding officer to go about the ship conducting first-aid drills, using moulages and simulated blood. Captive audiences are present all over the ship, and this is the corpsman's prime training time. You don't have a moulage set? Check the Federal Supply Catalog FSN 6910-809-6760 through FSN 6910-809-6880, and FSN 6910-540-6378.

Summary

In summary, there is a need for standardization of training; Shipboard Medical Guides; and the inventories in first-aid boxes, medical lockers and battle dressing stations. Such action could simplify and improve the medical training program. It would also enhance the medical departments' state of readiness for war. 🌿



Head & Neck

Oncocytic Adenomatous Hyperplasia

of the Larynx: A Case Report

By LCDR Michael J. Rensink, MC, USN,
Naval Hospital San Diego, California.

The term oncocyte was used in 1931 by Hamperl to denote a large cell with deeply eosinophilic finely granular cytoplasm and a small dark nucleus.

Oncocytic lesions are known to occur in multiple organs including: tongue, pharynx, uvula, esophagus, salivary glands, all parts of the pituitary gland, liver, pancreas, testes, uterine tubes, nasal mucosa, trachea, bronchi, thyroid, parathyroids, adrenals, and the larynx. Oncocytes generally resemble the cells of the epithelium in which they arise and are thought to develop from transformation of these normally occurring cells. Oncocytes are generally regarded as exhausted cells, although they retain the ability to undergo mitosis.

Gallagher and Puzon (1965) reported on 19 cases of laryngeal lesions composed solely, or predominantly, of oncocytes. The present case illustrates many of the characteristic features of these lesions and supports the contention of Kleinsasser, and others, that these lesions represent oncocytic adenomatous hyperplasia.

CASE REPORT

A 57-year-old female reported to the Naval Hospital San Diego, Calif., on 13 March 1972 with an 18-month history of hoarseness. She had been previously followed at Tripler Army Hospital in Hawaii and was referred to us for further evaluation and therapy. She had smoked three packs of cigarettes daily for 40 years until one and one-half years ago; in March 1972 she claimed to have smoked one pack of cigarettes daily for the previous year or more. The past medical history was significant in that she had undergone a thyroidectomy for a goiter, a lumbar laminectomy, nasal surgery, and a cystectomy with diversionary ileal bladder operation for carcinoma of the bladder, all in 1960. She had required a thoracotomy and tracheostomy following a severe automobile accident in 1966, and stated that she was currently under treatment for severe osteoarthritis of the cervical spine.

Her physical examination revealed a slightly obese lady with a very hoarse voice. Pertinent findings included thyroidectomy, tracheostomy and thoracotomy scars; a large nasal septal perforation with a large nasotracheal window, and, partially absent middle and inferior

The opinions or assertions expressed in the above article are those of the author and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

turbينات in the left nasal cavity. Abdominal examination revealed an ileal bladder in the right upper quadrant.

Indirect laryngoscopy revealed a reddish mass which filled the right ventricle. Both true cords moved normally. A laryngogram performed on 14 March 1972 defined a right ventricular mass.

On 17 March 1972 direct laryngoscopy was performed under general anesthesia. The examination revealed a 1-cm. reddish, polypoid, cystic lesion originating from the inferior surface of the right ventricular band and ventricle. A generous incisional biopsy was taken. The patient presented a relatively normal voice postoperatively.

Initially the pathologic report was, "Warthin's tumor of the right false vocal cord," but further consultation resulted in a final diagnosis of oncocytic adenomatous hyperplasia.

DISCUSSION

Oncocytic adenomatous hyperplasia of the larynx appears to present characteristic clinical and microscopic findings. The lesion ordinarily occurs in older people, usually over 50-years-old, and is generally symptomatic for a long period of time before a definitive diagnosis is established. This particular lesion originated from the false vocal cord, the most common site of origin. The tumor appeared as a cystic polypoid reddish mass protruding from the right ventricle.

Microscopically the lesion was typically multicystic in form, as seen in the first photomicrograph. (Figure 1.) Viewed under high-power magnification, the cells were found to be columnar with finely granular, highly eosinophilic cytoplasm and a small, centrally located nucleus. Normal cells were seen in close association with the oncocytic cells. (Figure 2.)

In the case under consideration, incomplete removal of the tumor was considered acceptable in view of its benign nature, and no further therapy was planned. The patient will be followed closely and if the lesion recurs, further surgery will then be performed. Malignant degeneration has been reported to occur in oncocytic lesions, but never in the larynx.

SUMMARY

A case of oncocytic adenomatous hyperplasia of the larynx is presented.

The clinical and microscopic features of this tumor type are discussed. Although this is a rare laryngeal tumor, it must be considered in the differential diagnosis of laryngeal lesions, especially those situated in or around the laryngeal ventricle.

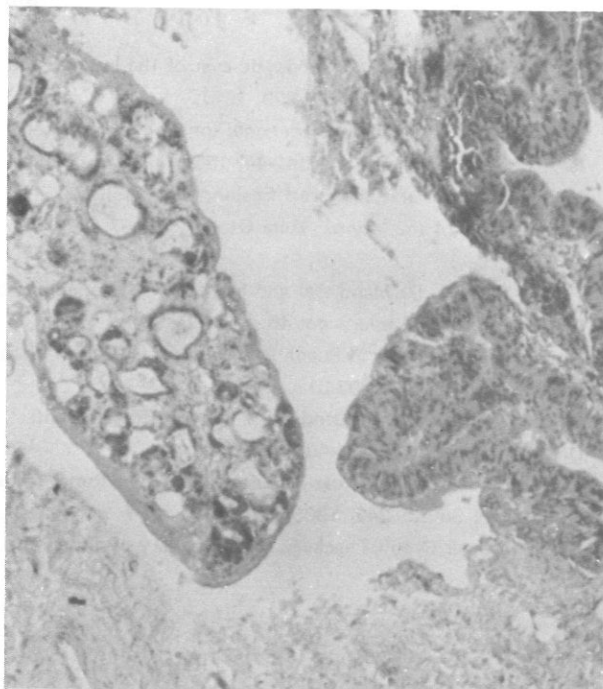


Figure 1.—MICROSCOPIC VIEW. Typical oncocytic multicystic tissue removed from the right laryngeal ventricle. (hematoxylin-eosin)

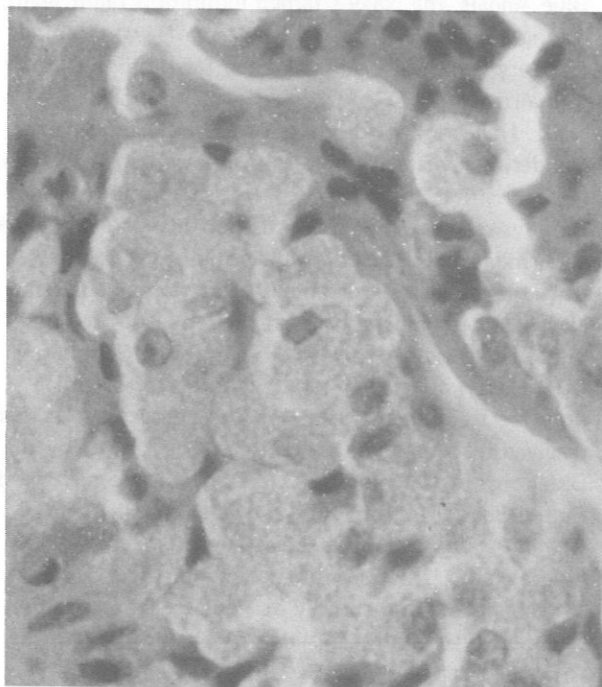


Figure 2.—HIGHER POWER PHOTOMICROGRAPH. Finely granular columnar cells with small central nuclei are seen in close association with normal cells. (hematoxylin-eosin)

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CDR HALL VISITS PENSACOLA

CDR H. David Hall, DC, USNR, obtained first-hand knowledge of the physiologic stresses encountered by Blue Angels, the Navy's famed exhibition flight team, during a recent visit to the Pensacola Naval Hospital. LT Gary Smith, a member of the team, piloted the F4J aircraft.

Dr. Hall, renowned Professor of Oral Surgery at Vanderbilt University Medical Center, Nashville, Tenn., is also visiting Associate Professor of Physiology and Biophysics at the University of Alabama Medical Center at Birmingham. Because of his noted expertise in unusual oral surgery, Dr. Hall has come to the Pensacola Naval Hospital several times at the request of the hospital staff dental officer, CAPT James H. Scribner. CDR Hall is a Naval Reservist who performs active duty for training at Naval Hospital Pensacola. Dr. Hall received his bachelor's degree from the University of Oklahoma in 1953 and his D.M.D. degree from Harvard Dental School in 1957. Four years of oral surgery training were acquired at Massachusetts General Hospital and the University of Alabama Medical Center.

Professor of oral surgery at Vanderbilt for the past four years, Dr. Hall also serves as a consultant to the Army at Fort Campbell, Ky.

"Doctor Scribner and I learned that at least one



VANDERBILT PROFESSOR OF ORAL SURGERY.—CDR H. David Hall, DC, USNR, is pictured in the cockpit of the Blue Angels' F4J aircraft. LT Gary Smith did the driving.

transfer from the Reserve to the Regular Navy was a direct result of our surgery and that makes us feel good, knowing that the Navy is making every effort to retain qualified people," said Professor Hall.—PAO, Naval Aerospace Medical Center, Pensacola, Fla. ☞

HAY-FOOT, STRAW-FOOT MEDICINE: 1861-1865

By CAPT C.J. McGrew, MC, USN,
Naval Hospital, Orlando, Florida.

No attempt has been made in this paper to thoroughly cover the subject, for that is impossible short of writing a book. This effort does not constitute a medical treatise, but offers a human-interest approach to the general view of military medicine as it existed in our earliest days. No partiality is intended, either in favor of the North or the South. Facts have been presented as seemed appropriate to depict the degree, and causes, of human suffering and problems that confronted physicians during the War. The performance and character of these men have never been surpassed in American history, from the initial agony at Jamestown in 1607, until the present. Out of this chaos, as has so often developed throughout history, great people rose to the occasion finding solutions to problems more often by serendipity than intent, and forging the beginning of modern military and civilian medicine. They led people to realize that there was

more to medicine than amputating a leg.

Before undertaking this review, I knew little more than the fact that the Civil War was fought over slavery, occurred more than 100 years ago, caused many deaths, and was won by the North after four long years of battle involving much terrain, including Bull Run and Gettysburg. Not much could be said for Civil War medicine, since so little knowledge of disease and technology existed at the time. After delving into it, I discovered that much of what has been written on the subject is now out of print, preserved in archives and difficult to obtain. Except for the contributions of a few Civil War buffs published in 1966 medical journals at the time of the Civil War Centennial, the subject is rapidly fading into oblivion. I am indebted to Brooks and Steiner, authors of two useful books on medicine as it was practiced during the Civil War, and numerous articles written by authors interested in specific areas or aspects of the subject.

We commonly speak of the centuries of Dark Ages in European history, followed by the Renaissance with a new awakening in freedom, knowledge and understanding. The Civil War may be viewed as the Renaissance of modern American medicine. It spurred the

The above article is based on material assembled for a verbal presentation by the author before the local chapter of the Daughters of the Confederacy.

The opinions or assertions are those of the author and are not to be construed as official or reflecting the views of the Department of the Navy or the naval service at large.

beginning of an incredible evolution of medical progress. Some innovations are credited to the Federal forces, some to the Rebels, but most medical problems and solutions were experienced and shared by both sides. After all, the physicians involved had mostly trained together in the North in the same schools; the troops suffered from the same diseases and were treated with the same medicines; and during the course of the War, at one time or another, all had lived in the same geographical areas.

Before the first fatality occurred on Sunday, April 14, 1861 at Fort Sumpter (accidental casualty during a misfire of a 100-gun salute), American medicine was pretty much a horse and buggy operation. The doctor's long suit was a good bedside manner for he could offer little else. There had been no need for large hospitals because precious little could be accomplished that could not be done just as easily, and usually better, in the home. Surgery was rarely attempted, due to a lack of satisfactory anesthesia. Only shortly before the War, a demonstration of anesthetic technique was presented to skeptics in Boston, in 1846. Under ordinary circumstances, victims fortified by a shot of whisky and biting hard on a bullet, were left to view and ponder the terrifying assault on their person which surgery entailed. It is true that Dr. Ephram McDowell had removed an ovarian cyst as early as 1809 without benefit of anesthesia, but this was not a common occurrence.

While this War has been regarded by some as a "Gentlemen's War" tempered with brotherly love from the start, where men sometimes crossed the lines at night to play cards, it remains on record as the bloodiest war in U.S. history with 620,000 deaths, more than the total U. S. losses combined for all other wars. It is a startling number of deaths when one considers that the total civilian population was only 10% of what it is today. On paper, the total for blue and gray military forces exceeds the combined membership in today's Army, Navy and Air Force. In fact, 25% of the total population was on active duty at some time during the War and many additional volunteers helped in special areas of service. Paper strength is emphasized because many regiments could muster fewer than 200 out of 1000 men at a given point in time; the rest were buried beneath the sod, incapacitated in hospitals, sent home to convalesce on medical leave, deserted, or were just plain sick and unable to fight. Many a battle was won or lost because of diseases. The first attack at Vicksburg is best summarized as disease, defeat and retreat, with the South victorious despite far fewer forces.

In fact, the chances of dying from disease (rather

than wounds) were greater than three to one (see Table I). One soldier wrote home that "these big battles is not as bad as the fever." A rural farm boy had a one-in-four chance of not coming home alive—contrasted to one-in-126 during the Korean War. In fact, the incidence rate for intestinal fevers was 29 times as high as that in World War I and the death rate for intestinal disease was 258 times as high; an even greater difference would result in a comparison with statistics of today. Each soldier, who averaged only one year

TABLE I
DEATH FROM DISEASE & WOUNDS
IN MAJOR WARS

War	Disease Rate (1000/year)	Mortal Wounds (%/100 wounded)
Mexican	102	12.9
Civil War (Union)	62	13.3
Spanish American	25.6	6.1
World War I	16.5	8.1
World War II	0.6	4.5
Korean	0.5	2.5
Vietnam	0.3*	2.5**

*0.3 per 1,000 average strength in Vietnam of Navy and Marine Corps personnel only for the period FY 1967-1969.

**2.5 per 100 hospitalized battle casualties (WIA) refers only to Navy and Marine Corps personnel for the period FY 1967-1969. (Courtesy of the Officer in Charge, Naval Medical Data Services Center, NNMC, Bethesda, Md.)

on active duty, if he lived so long, fell heir to three or more major diseases. Considering the poor reporting which existed, the true average may well have been many times this number of diseases. One Confederate medical officer in a hospital wrote: "Normally it takes 33 years to melt away a generation. Now it takes five years and if this War lasts three more years, few indeed who went forth at its beginning to dwell in huts, sleep on the moist ground, march in pelting snow storms, to shiver around the campfire and have frost-bitten feet as a reward for being a good sentinel, to be waded in scum and contempt by those whose rights and property they are defending, and to face the leaden hail of death, will ever return to their homes again." Things were generally so bad that healthy regiments attracted unwarranted attention—one was

even investigated twice on suspicion of falsifying sick reports. More than 100 companies were commanded by medical officers, yet records indicate that these troops fared no better than others with respect to the incidence of disease. One such company was commanded by Brigadier General Boussy.

Toward the end of the War, one New England surgeon wrote home that he hoped "soon to return home where malaria was not inhaled with every breath, Nature is not always antagonistic to physicians, and a vigorous, rapid, and complete convalescence is not an impossibility."

While the Minie ball (a small conical lead bullet fired in a rifled barrel and developed in France) was the chief weapon and responsible for 94% of wounds, "canister" was a common, less accurate weapon with tremendous destructive power. It was basically a can filled with sawdust and lead bullets, shot from a Napoleon cannon. The Minie ball with its lethal range of more than 200 yards, surprisingly was introduced into the U. S. by Samuel Guthrie, the same man who discovered chloroform—the chief anesthetic used in amputating the mangled limbs which the Minie ball caused. Although Stonewall Jackson was known for his "give 'em the steel" admonition to wield the bayonet, both the North and South regarded the implement as a pick, spit for roasting, or can opener. In fact, fewer than 900 total bayonet wounds are recorded for the entire War by the Union, and only six out of 7300 casualties delivered to one hospital at Gettysburg were the result of bayonet or saber. "They were fearful to look upon but their points were rarely darkened with blood."

A physician, Dr. Richard Gatling, developed the machine gun or "Gatling gun" in 1862. It was not adopted for use during the Civil War, but awaited World War I for use, with modifications. The Civil War was strictly a rifle war, but it was also the proving ground for all kinds of weapons. The first repeater (seven shot) was personally tested by President Lincoln. The first accurate breech-loading gun with rifling gave accuracy beyond any previously attainable, resulting in the "sharpshooter" label.

Although the Minie and canister completely leveled and denuded some forests where fierce battles were fought, disease was the primary victor of the War. Microbes possessed all of the advantages—invisibility, secrecy, versatility, surprise, small bulk, speed, and rapid multiplication at the point of impact, while arms had to be laboriously carried up to the front from factories that were frequently located overseas. In fact, the Civil War provided the last opportunity to study natural biological warfare on a large scale before the

advent of the antibiotic era. While no active biological warfare is known to have occurred, one stricken company requested active duty so that, if nothing else could be done, they could at least give the Rebels smallpox. One Confederate surgeon said the Yankees drove a Negro with smallpox across the Rappahannock River to spread the infection. An exchange of prisoners at Fort Pillow resulted in the transfer of several soldiers with smallpox, but a later investigation did not prove that the action was deliberate.

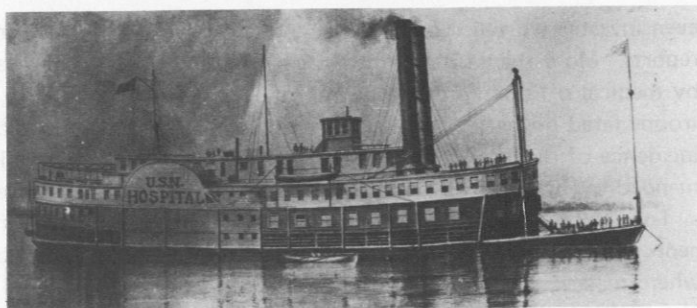
Rural American farm boys dominated the camp; their hair, feet, and beards entered the camp uncombed, dirty and unkempt. Feet got dirtier and habits got worse as the War grew on, if that were possible. Hair length was controversial then, as now; short hair was encouraged; long hair was considered unmilitary and especially during the summer months, unhealthy. In many regiments, the extent and degree of poor hygiene were no different among the officers and men; officers were frequently elected by popular vote from among the men. One Ohio sergeant wrote, "We all scratch alike, generals and privates." Some wore their clothes for two months without stripping. Even in regiments where concern was shown for cleanliness, "men were not required to wash their feet and sometimes not even their faces or necks." In the Confederate Army matters were worse because of a soap shortage created by the blockade. Command and regimental officers on both sides set bad examples. General Lee wrote in 1862, "Until the regimental officers can be made to appreciate the necessity for . . . enforcing cleanliness, I fear the sanitary conditions of the Army will not improve."

Camps in the Washington, D.C. area were described as reeking with rotten garbage, open sewers and overflowing latrines, if they were even used; dead cats and dogs were the rule and not the exception. This produced an olfactory sensation never since duplicated in the Western Hemisphere. The horrible state of sanitation was only partly responsible for the spread of disease. Lack of refrigeration and bad kitchen practices were two other contributing factors and at least one incident is recorded wherein 2000 men contracted food poisoning attributed to a specific dessert.

Screens were in use in the civilian world but did not exist in the military, save for one notable exception. The Confederates boasted the first hospital ship ever outfitted, the *Red Rover*, resplendent with screens, operating rooms, elevators, diet kitchen and the first female nurses aboard ship.

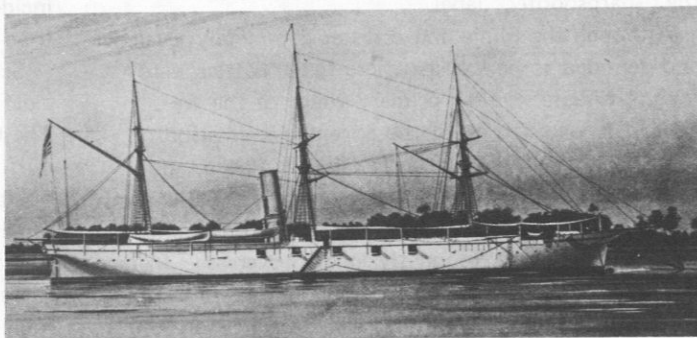
Water was usually obtained from the local creeks, shared alike by the thirsty, bathers, launderers, horses, mules, commissary cattle, flies, mosquitoes and other

USS RED ROVER—A wooden side-wheel steamer captured from the Confederate States Navy in April 1862, repaired and fitted out in the next few weeks as a floating hospital to support the Union Navy's Western Flotilla. She boasted an ice box with a 300-ton capacity, bathrooms, laundry, elevator for moving patients from lower to upper deck, amputation room, gauze blinds over windows to keep out cinders and smoke, and female nurses. RED ROVER consumed 37½ bushels of coal per hour and had a maximum upstream speed of nine knots.



COMMODORE WILLIAM WHELAN—Commissioned a surgeon's mate in the Navy on 25 March 1828, Dr. Whelan was Fleet Surgeon of the Mediterranean Squadron during the years 1843-1845 and 1849-1852. Appointed the third Chief of the Bureau of Medicine and Surgery in 1853, he received the honorary rank of Commodore, and served in this high position until his death in office on 11 June 1865. Under his leadership new hospitals were commissioned at Annapolis and at Washington, D.C.; RED ROVER became the first American naval vessel commissioned as a hospital ship; Use of the hypodermic syringe and improved anesthesia occurred; and Surgeon Horner of the Gulf Squadron wrote "Diseases and Injuries of Seamen" for the guidance of 200 physicians in the Navy's Civil War Medical Dept.

USS PAWNEE—Placed in commission 11 June 1860, this steamer had an excellent combat record, was attacked simultaneously by two Confederate batteries on 16 July 1863 at Grimball's Landing, and was instrumental in the successful defense of General Terry's forces. On 17 Dec 1870, PAWNEE went into commission at Norfolk Navy Yard as a hospital ship.



animals. The water source was considered acceptable if it was clear and without odor. Unfortunately, "acceptable" water could still harbor typhoid micro-organisms as nearby latrines contaminated the supply. Camps were located near low-lying rivers and creeks, favoring the spread of malaria through infected mosquitoes whose potential was unrecognized at the time. "Potomac" fever was actually typhoid fever contracted in the low-lying areas of Washington, D.C., where it ran rampant for years.

Scorbutic diathesis was a popular diagnosis generally applied to malnutrition and improper food. While the North fared better than did the South where food was concerned, both armies suffered from inadequate supply departments and food shortages caused by red tape, incompetence, and downright dishonesty. An investigation at a hospital in Fallmouth, Va., revealed that patients received salt pork, wormy hardtack, and coffee while the nearby Aquia Creek warehouse contained fresh vegetables, chickens, fruit, pork and beef, with no one having authority to draw the supplies. At the earlier Vicksburg encounter, food was so scarce that Johnny Reb ate fried dog meat, boiled cat and roasted wharf rat. Foraging was carried out by both sides; cows were taken on the hoof, chickens decapitated on the spot, larders sacked, and wine chests drained. By the end of the last year of the War, civilians fared little better than military when eggs rose to \$25 a dozen in the North and \$5 each in the South. This can be compared to a nurse's pay of \$11–\$15 per month. Early in the War the South was reduced to drinking chicory and acorn coffee which was "singularly vile." Other coffee substitutes included parched okra seeds, rye, cotton seeds, sweet potatoes, corn and peanuts. After some of the supply problems were investigated and corrected, when food supplies were deemed adequate, it was said that the officers ended up with less whisky and the enlisted men with more food.

Things were not much better in civilian life when a soldier was sent home on convalescent leave to recuperate from malnutrition and scurvy. The price of bacon rose to \$11 a pound and a small dish of corn, or a watermelon cost \$10. One southern matron bargained for a daily dish of vegetables for a sick soldier for 14 days, at a cost of \$14. On delivery the "dish of vegetables" contained two beets and four onions.

Even the elements conspired against the men at times. One soldier wrote, from Arkansas, "This is a vile place. It is unhealthy and nothing can live except mosquitoes and I am credibly informed by the oldest inhabitants that the snakes have chills in the summer." The bad food, bad clothing, and bad water improved

in the North as people rallied behind the flag; the people ceased to regard the War as a Sunday afternoon picnic affair, as they had deluded themselves at the first battle of Bull Run. While the North developed a desiccated carrot later in the War, the troops called them "desecrated carrots," suggesting their poor quality. Unfortunately, the lack of raw materials in the South precluded any improvement; only further deterioration was possible. One soldier reported that "beans killed more than bullets." By the middle of the War one-half of the Confederates were without coats and some were almost naked. At times, as many as one-third had no shoes. Inadequate clothing and exposure doubled the pneumonia rate and materially increased the incidence of other illness in the South as compared to the North; frostbitten feet were common. The bloody ground was more a consequence of frostbite than wounds and amputations which were frequent. The frostbite patients generally succumbed to overwhelming sepsis and infection. Many went to bed at night with dogs to keep warm.

While some medical guidelines existed for recruiting men, the physical examination was frequently a farce or nonexistent. One doctor bragged that he conducted 100 physicals in an hour; some never saw the doctor or any other medical representative. Because three-fourths of the men discharged during the first year had diseases which had existed at the time of enlistment, the Chief of the Bureau of Medicine and Surgery (North and South, respectively) demanded and got better physicals. An inspection system was set up and recruits were reexamined at training centers; General Lee was first to suggest these training centers, to intentionally expose recruits to common childhood diseases which ran rampant during the initial months of active duty. Toward the end of the War, because of the heightened intensity, the situation deteriorated and "if the recruiting door was wide open in the North, it was off the hinges in the South." While President Lincoln closed the gap created by losses, by squeezing the recruiting, Jefferson Davis was scraping the veritable bottom of the barrel. Ultimately, the Confederacy conscripted everyone from 16 to 60 years of age who could bear arms, including those for local defense. Rural American recruits were not infrequently illiterate. They did not know their left foot from the right, so drill instructors tied a piece of hay to one shoe and straw to the other. The appropriate cadence used was "Hay-foot, straw-foot; hay-foot, straw-foot."

Although the first battle of Bull Run was won hands down by the South, medically it was a disaster for both sides. Physicians had no authority and were insufficient in number; Regimental surgeons refused to

treat anyone but their own men; Ambulances were few and were driven by drunks who deserted at the first shot, stopping only to rob the dead and then hightail it back to Washington for more liquor. Soldiers cried for someone to cut off a leg mangled by a Minie ball, and those who survived lay on the battlefield for a week before family and relatives came looking for their kin. The living squirmed among the dead and the only helpful sign was that of a blood gush easing into an ooze. When the wounded arrived in the Washington, D.C., or Richmond area, they found inadequate filthy hospitals, or none at all. For days soldiers wandered the streets, pounding on doors; the lucky ones were admitted. By the second Battle of Bull Run when 23,000 casualties occurred, chaos still existed, despite some improvement. The first battle was "a mere twitch" compared to this "convulsion."

The deplorable state of affairs precipitated a number of medical developments. Need for an organized, trained ambulance corps, as well as some better vehicle than the two-wheel "avalanche." Large military hospitals were an obvious necessity; prior to this time the largest was a 41-bed hospital at Fort Leavenworth. By the peak of the War the South had 150 hospitals with one-third situated in or around Richmond, including the 8000-bed Chimborazo Hospital on the James River, the largest military hospital ever constructed. The North eventually had over 200 hospitals situated in most major cities in the United States; 16 were located in the Washington, D.C. area. Earlier, the Georgetown Prison was emptied for use as a hospital and as late as 1862, casualties were still housed in the Rotunda of the U.S. Capitol; church pews, hotels, farmhouses, pigsties, and even the Lee Mansion were used to house Northern casualties. The accurate maxim that hospitals were filthy dirty and should be avoided was slowly overcome as people began to apply Florence Nightingale's dicta learned in the preceding Crimean War — "Throw open the windows and use plenty of soap and water." This was the major explanation for the drastic drop in mortality rate, from 60% to 7-8% for serious wounds by the end of the War. Later in the War, both sides had hospital ships (such as they were) and the North developed a mobile hospital, one of which contained 5000 beds. Specialty hospitals were also developed for exclusive treatment of such things as smallpox, infection, eye and ear diseases, venereal disease, orthopedic problems and nervous disorders.

Nearly all hospitals were wooden, with open-flame illumination and wood-stove heating. Very few escaped without some fire damage during the four years of the Civil War and many burned to the ground. Water to

fight such a fire was almost nonexistent. On the battlefield there was a problem, in that some officers received preferential treatment. But in the hospitals this special consideration ceased. In fact officers were not usually treated in the hospitals and had to seek their own medical care—"after all, they were salaried." Both sides altered this custom in 1864 and provided "officer hospitals." Staffing with paramedical personnel posed a problem. In a 5:1, male: female ratio, nurses ordinarily were convalescing patients, drunks, undesirables and deserters, initially. The only women serving as nurses were religious groups, such as the Sisters of Charity. Religious groups provided the only organized nursing training and nursing was generally regarded as a demeaning task, on a par with scrubbing floors. Nurses were paid only \$11 per month (when the cost of one egg rose to \$5 in 1864 in the South).

Dorothea Dix was given the job in the North, by the Surgeon General, as a volunteer to recruit and train nurses. She set strict guidelines for acceptable nurses: over 30 years of age, single, no bows, no curls, no hoop skirts, no jewelry, no make-up, and clothing to be brown or black in color. She turned away most applicants as being too young or too eager. She alienated most doctors, being too bossy. Clara Barton, who later founded the American Red Cross, was one of the few nurses active in the field, moving about bandaging and giving her favorite treatment for shock—bread dipped in wine. Sally Tompkins of Richmond stepped forward when needed to set up a private military hospital that achieved one of the lowest mortality rates of any hospital. When all hospitals of the South were put under Government control, she was commissioned a Captain and became the South's only commissioned female officer. Truly, women's involvement in the Civil War heralded the beginning of the "Women's Lib" movement in the United States.

Physicians covered the gamut from regular active duty, to Reserve and part-time, including some quacks and charlatans. It should be noted that most doctors were doing their best and the few undesirables gained entrance because of poor or nonexistent medical officer screening boards during the early months of the War. Many were poorly trained but well motivated. Some were misused, voluntarily or otherwise, as combatants or privates in the line. Both sides suffered badly from medical personnel shortages. Many "surgeons" had never done any surgery and their indoctrination or "baptism by fire" consisted of performing multiple amputations on the battlefield. One surgeon was described as having a "saw dripping with blood between his teeth, ". . . this he snatched, wiped "on his blood-stained apron and began hacking away."

His operating table (a door placed over two chairs or barrels in the open air, to make use of the sun or moonlight and to avoid explosive hazards presented by use of volatile anesthetics around lanterns) was surrounded with gooey mud admixed with blood and amputated specimens of mangled arms and legs. One critical medical officer alleged that surgeons always imperiled life and often caused death. Some are said to have dreaded going into battle for fear their own men would shoot them in the back. "Butcher" surgeons were said to be numerous and many a soldier preserved his own limb by hiding a pistol under his pillow and pulling it out at an appropriate time.

Surgery was not limited to amputation of arms and legs although the procedure did offer favorable results with 30-80% recovery depending on the level of amputation. Plastic surgery had its start with some amazing though crude reconstructions of mangled faces. Chest surgery (mainly returning bulging contents to the chest cavity) had its beginning; about 60% recovery was achieved using collodion air-sealed bandages on chest wounds. Head surgery, consisting mainly of burr holes or removal of bone fragments, was performed but was not too effective from the standpoint of high mortality. Wounds of the abdomen and spine were uniformly fatal due to peritonitis and infection. Such patients were usually left in orderly rows for nature to take its course; this was the beginning of modern-day triage or casualty sorting.

The state of the medical art was primitive by our standards. Harvard Medical School did not own a stethoscope (which had been introduced in Europe ten years previously) and neither did they own a microscope or ophthalmoscope. Clinical thermometers were available but were rarely used. Dr. Joseph Jones, an outstanding southern physician-researcher, is said to have been the only Confederate surgeon to make use of a thermometer. (He also recommended the use of iodine on cuts and abrasions.) The Surgeon General of the Union Army, at the start did not feel that medical books were important and therefore bought none; furthermore, he did not even feel that an organized medical corps was necessary. Tents, food, and medical supplies were allocated to the wrong places thanks to an equally delinquent Army quartermaster corps. One surgeon confessed to Clara Barton at Antietam: "I am tired of this inhuman, incompetent, neglect and folly which leaves me alone with all these sick and wounded, 500 of whom will die before daybreak unless they have attention and treatment, and I have only one five-inch candle for light."

Conditions such as these prompted the civilian population to rise up and do something. A group of women

from New York City, with a Unitarian preacher descended upon Washington to force the formation of the "Sanitary Commission" in May 1861, against the wishes of Congress, the Department of the Army, and President Lincoln who regarded this intrusion as evidence of a lack of confidence in the leadership. Fortunately, the Army Surgeon General was homesick and therefore absent; his deputy perceived the wisdom of establishing such an organization and succeeded in convincing President Lincoln to follow the civilian recommendation. It brought about a purging and reorganization of the medical department from top to bottom starting with a new Surgeon General, William Hammond. Aided by the "Christian Commission" from churches, the Sanitary Commission raised \$15,000,000 and assisted in the relief of human suffering endured by hospitalized soldiers throughout the War.

Surgeon General of the Army Hammond had unbounded energy and inaugurated many things still considered important today, including proper records for the sick, wounded and dead; hygiene and sanitation manuals; a system of disease classification; good medical supply systems; a permanent military hospital in Washington, D.C.; creation of an ambulance corps with attendants, the first true "medics"; the establishment of the Army Medical Museum; Army Medical Library (now the National Library of Medicine); and the Army Medical School. Primarily through his influence, the cumulative Index Medicus was begun. He brought about changes which were quick and drastic; since many had been passed over in his selection, he had also acquired many enemies. When he tackled the modernization of drug treatment, among other things he removed supplies and forbid the use of calomel (mercury-containing cathartic which when used in excess, as it usually was, caused mercury poisoning). His right-hand man and assistant was Surgeon Letterman, for whom Letterman Army Hospital is named. Disgruntled, older physicians took their gripes to Washington in the "Calomel Rebellion" and ultimately caused Dr. Hammond's dismissal from the Army a year later, following a kangaroo trial. Twelve years after the War, on review of his case after he had become an established successful civilian neurosurgeon, he was reinstated as a Brigadier General.

Dr. Mary Walker from Syracuse Medical Center was the first military woman medical officer but was forced to serve as a nurse for the first three years of the War.

Relationships between the line and medical officers later in the War were inconsistent and variable. Some commanders felt too many men were hospitalized and

others felt too many who were sick were returned to duty.

A medical department in the South was hastily put together by Surgeon General Preston; it was composed of 50 or more medical officers who had defected from the Union. At the peak of the War 3,000 doctors were on duty with the Confederates, suffering from similar supply problems as were their peers in the North. Dr. Preston early implemented the reading of regular medical journals and, following the desires of Confederate President Jefferson Davis established the first organized dental corps. Unfortunately, at the start of the War, the few Southern medical schools in existence (except for the University of Virginia) closed their doors. The reason for this is perhaps because all the available faculty members had been pressed into military service. Another unfortunate incident has seriously limited the compilation of history concerning the Confederate Medical Department in the Civil War — the loss of nearly all records in the Richmond fire in 1864. The small amount that is recorded was primarily reconstructed from memory of those officers who had been involved in the conflict.

Medicines employed in the Civil War era were all too often useless by today's standards—some that are now judged to be effective were not understood at that time, or were used in inadequate dosage. The effective drugs included opium, morphine powder (dusted in wounds), belladonna, digitalis leaf, quinine, and various cathartics (usually too potent). The South's second most serious problem was the lack of drugs; first was the lack of adequate transportation for the wounded, primarily as a result of insufficient vehicles and animals to pull them. Without industry and raw products, and with effective blockade of their ports by the North during the latter half of the War, the South was forced to depend on European shipments which carried a 50-50 chance of getting through. The cost of quinine increased to \$188 per ounce, if indeed it could be obtained at all on the black market.

While quinine was known to control malaria, it was used prophylactically in an alcohol elixir; the proper dose was not established. When supplies of quinine ran short and the proportion of quinine was decreased, the soldiers were delighted because the alcohol tasted better. Supplies were so short in the South that substitutes were sought and as one soldier wrote, "We skin willow and dogwood bark and drink the tea, but I am having fever every day."

Because medicines were contraband and could not be shipped across the lines to the South, Surgeon General Moore directed Surgeon F. R. Porcher in the

spring of 1862 to compile for distribution a book of "indigenous remedies." The quinine substitute known as "ol' indigenous" was one of the recommended suggestions and contained poplar bark, in addition to the other ingredients. It was brewed "in 90-proof whisky (usually from moonshine stills)," which may have accounted for its acceptability—otherwise the effect of the remedy was sometimes worse than the disease. Even today Dr. Porcher's book provides a wealth of medico-botanical information.

Tincture of aconite (or monkshood) was used as an external local anesthetic; poppy heads, nightshade and stramonium served to relieve pain; pokeberry combined with sarsaparilla root, sassafras, alder, or prickly ash were used for analgesia; mutton suet and sweet gum as salve for sores; cucumber balsam for burns; blackberry cordial, or tea of red root or Sampson's snakeroot, for diarrhea; horsemint and broom sedge tea for colds; red oak bark and alum for rash; fennel seed for paregoric, etc. Laxatives were made from blackroot, May apple, white walnut bark or peach tree leaves; poultices were made from onions, garlic, poke-root, celery, pepper, parsley and sage. Pneumonia was treated with turpentine, creosote, goose grease, honey, and brown sugar cough syrup and mustard plasters (seed or leaf alternating with butterfly root and Sanguinaria) "until a state of nausea was produced." Wounds were usually treated by both sides, with cold-water dressings and a red oak bark concoction sometimes added for disinfection. Other medicines included almost anything with an interesting smell, appearance, or taste. People considered that the worse the taste, the more potent the medicine.

Medicines tended to revolve around the bowels, urine, and blood; any medicine which affected their consistency or appearance was considered beneficial. If a particular substance provoked a stool or a healthy stream of urine, it was good. This preoccupation with purgatives and drastics of the rebellion probably sent many a soldier to an early grave.

Sick call, as conducted in field medicine was frequently much simpler. Dr. William H. Taylor wrote:

On the march our own practice was of necessity still further simplified and was in fact, reduced to the lowest terms. In one pocket of my trousers I had a ball of blue mass,* in another a ball of opium. All complainants were asked the same question, "How are your bowels?" If they were open I administered a plug of opium and if they were shut I gave a plug of blue mass.

*preparation containing powdered mercury

Later in the War the Surgeon General of the Confederacy ordered that drug factories be set up in the South to meet the Army's needs. The "Ladies Aid Society" tried their hand at medicinal gardening, cultivating some of the indigenous tree and herb substitutes. In the North, reputable drug houses which still flourish today were in business prior to the Civil War—Squibb, Wyeth, McKesson & Robbins, and Pfizer, to name a few—but as costs rose, the Federal Government entered the drug-production business. Quacks and tonic peddlers were common; even President Lincoln tried to convince Surgeon General Hammond that Dr. Forsha's tonic worked wonders in the treatment of gunshot wounds.

While the South did not possess the capability to manufacture bandages and suture material, the upper hand in decreasing infection was fortuitously extended. A favorite substitute for bandage was scorched cotton which became sterilized in the scorching process, and boiled horsehair for suture was likewise sterilized in the boiling process. Bandaging was not always so fancy though. In the field, when battle casualties were high and supplies were low, grass, dried leaves, and corn shucks were used. A dirty, wet sea sponge was generally used in surgery, from one patient to the next; if it dropped on the floor, it was only rinsed out in a cold-water basin and used again. A septic surgical technique was still nearly 20 years away, and steam sterilization was to be developed in 1882.

The lack of asepsis led to the inevitable postoperative infection; surgeons thought all wounds had to heal by infection with "laudible pus." Infection and postoperative hemorrhage (the most frequent and dreaded complication because it usually led to death), caused much postoperative gangrene. Hemorrhage frequently resulted from the removal of ligatures from arteries, several days after the surgery. If the infection and gangrene necessitated a secondary higher amputation, a very high mortality rate was realized; accordingly, adequate amputation was attempted at the start, rather by the guillotine method or by flap method. Since the only alternative to these radical amputations was death from infection, there was no rational choice.

It is remarkable that, in the absence of immunization for tetanus, more lockjaw was not seen. Only 505 cases were recorded and almost all of these developed in "hospitals" located in barns that were ankle-deep in manure. The low incidence rate of lockjaw was probably attributable to the fact that most of the more than 2100 battles were fought on unplowed, unmanured fields. Equally surprising, and probably for the same reason, little gas gangrene was seen. When wounds became badly infected, the surgeons intro-

duced maggots to debride the dead tissue. This practice was more common in the South than the North.

Recognizing the serious consequences of hemorrhage, Civil War surgeons discussed the art of transfusion of blood. Prior to the War, many attempts to transfer whole blood had been made in Europe and later in the U.S., usually employing animal blood with variable results; certainly in light of today's knowledge, death from transfusion reactions must have usually resulted. Four instances are recorded, wherein human blood was transfused during the Civil War, with two successful outcomes based on the fact that one patient died some months later of another cause, and one patient lived for several years in New York after the War. One of these transfusions involved two ounces, and the other more than ten ounces of blood; which was injected intravenously by syringe. No indication that any anticoagulant was used is recorded. One of the other cases consisted of placing blood into the open wound and sewing it closed, not a true transfusion. The patient died soon thereafter, either from transfusion reaction or other cause, since he was almost moribund when the procedure occurred.

Several other American surgical "firsts" came out of the Civil War—a balanced traction for femoral fractures, better fracture splints, and the use of plaster of Paris for casts.

Anesthesia in the North was more often achieved with ether, and in the South, chloroform; both were administered by open-drop method. Sometimes the patient was in such shock that little was needed. A total of 80,000 anesthetic procedures were recorded in the North, mostly for amputations. The standard procedure was to start the anesthetic agent dripping and when the patient appeared unconscious, begin the cutting which frequently lasted only several minutes. It was rarely necessary to administer the anesthetic a second time—a fact which may account for the low number of anesthetic deaths recorded. It is likely, however, that more anesthesia fatalities did occur in both the North and the South, but were inadvertently attributed to other causes. Since the North had good sources of pharmaceutical supplies, shortages were seldom imposed except at Winchester, Va., when the South captured 15,000 cases of chloroform. The South acquired many medicines, and nearly all of their medical instruments, by capturing enemy supplies. A dose of whisky was used as premedication until late 1865, when a dose of morphine was sometimes used.

While surgery was beginning to come of age, diseases were more or less rampant, uncontrolled, and not understood. "Chronic camp diseases" (diarrhea, dysentery, typhoid, and malaria) sapped the energy of

both sides and caused more than 100,000 deaths in the Union and Confederacy forces. (See Table II.) Battles were lost before they were fought, because of these; Chickahominy long evoked a picture of disease rather than battle. Most soldiers considered that "good guts were more important than good brains," resenting the fact that they "lacked the guts" for soldiering in spite of these diseases. So many died of disease at Vicksburg that they dispensed with music and rifle volleys at funerals, not just because it was so

depressing but the ceremonial rifle volley had become so frequent that it sounded like an engagement.

In 1861 both sides claimed 700 cases of diarrhea per 1000 troops, and during the War it only grew worse. One Confederate surgeon commented that nine out of ten recruits had diarrhea and few soldiers achieved a molded or formed bowel movement. Constipation was definitely a luxury. Unfortunately one misguided Confederate, thinking magnesium sulfate to be good for diarrhea, ordered 150 barrels of the salt for the battle

TABLE II
CIVIL WAR DISEASES (UNION)

Disease	Number of Cases	Number of Deaths
Diarrhea & Dysentery	1,700,000	44,500
Malaria	1,300,000	10,000
Respiratory	283,000	500
Typhoid Fever	148,000	34,800
Syphilis & Gonorrhea	80,000	150
Pneumonia	77,000	20,000
Jaundice	70,000	400
Measles	76,000	5,000
Tuberculosis	29,000	7,000
Smallpox	19,000	7,000
Liver Abscess	12,000	300
Meningitis	4,000	2,600
Yellow Fever	1,300	400
Rheumatism	286,000	710
Scurvy	47,000	770
Insanity	2,600	90
Sun Stroke	6,600	261

(Many miscellaneous conditions have been omitted for the sake of brevity.)

at Corinth in 1862; Corinth went down in history as a battle of dysentery. General Beauregard was forced to abandon the defense of this important railroad center because of these devastating diseases.

These fluxes, as they were known were bad enough; but if they did not do a man in, the treatment would. Before his death, one Private Leopold was treated with lead acetate, opium, aromatic sulphuric acid, tincture of opium, silver nitrate, belladonna, calomel and ipecac—all without benefit; the coup de grace was a steaming mustard plaster just before death. The pharmacology of belladonna and opium was not well understood at that time, and frequently these drugs were administered in combination with other drugs that exerted the opposite action. Other treatments bore the same relationship as "gasoline to a blazing fire."

Typhoid fever really encompassed a group of diseases which were classified together and treated the same as other fluxes. One nurse, however, recorded a rather unique regimen: "clothes were dipped in brandy and red pepper, and bound around the feet, hands and chest." Although the patient survived, one would be hard pressed to prove the efficacy of peppered brandy. Knowledge of carriers did not exist.

Smallpox was the only disease for which immunization was available, but only sporadic use of immunization was made. Notable outbreaks occurred at Antietam and Chancellorsville in Virginia. When panic broke out among the soldiers, they inoculated themselves to the point, especially in the presence of poor sanitation, that many suffered generalized reactions and became seriously ill. Little was known about effective quarantine but it was practiced for this disease.

Yellow fever was a dread disease, but was only encountered in South Carolina and early in New Orleans. Port quarantine was effectively implemented at New Orleans to prevent recurrence of the infection in that area for several years. Of course one factor which limited spread was the short range of the mosquito vector.

"Boys have always followed the flag and girls have always followed the boys." Diseases of indulgence were common; prostitutes operated in all towns, frequently in camps; one got on a recruit troop train disguised as a Major from Boston. One reporter in Washington, D.C., wrote that quinine might be a necessity and in short supply in the South, but copaiba (a thick, yellow-brown, spicy-smelling liquid with an ungodly taste, used to treat gonorrhea) was in short supply in the North. The venereal disease case rate in the North was reported at 82 per 1000 troops for four years, but probably was much higher. Figures

are not available for the South because of the Richmond fire.

This War started out as a gentlemen's war with good treatment of enemy soldiers in prisons. As the War drew on, however, supplies grew short, the number of prisoners became large, and conditions deteriorated on both sides. Andersonville in Georgia was the South's worst prison camp, and Elmira in New York was the North's worst. At Andersonville the death rate rose to 793 per 1000 inmates each year; a total of 19,000 Rebels died in the Northern prison camps, and 26,000 Federals died in the Southern prison camps. Adequate housing, food, clothing, and medical care almost disappeared as the War drew on. In Andersonville the inmates dug tunnels out in the yards and lived in them, lacking any other adequate escape from the elements. Medical officers that were captured were also held as prisoners, prior to May 1862. When General Jackson entered Winchester, Va., in May of that year he found seven Federal surgeons caring for 300 sick and wounded, and directed that the physicians continue their effort. He supplied them with assistants for nursing and necessary provisions. A few days later all of the physicians at that hospital were paroled and sent to the Secretary of War in Washington for reassignment. Subsequent to that time, it became common practice, on both sides, to return all captured medical officers to their regiments. This exchange of physicians preceded the similar ruling of the Red Cross, by almost two years.

It will be noted that this paper has been largely concerned with the Army except for the mention of hospital ships and the blockade of southern ports by the Union. Both sides had navies and fought battles at sea. Sanitary conditions aboard ships were often superior to those ashore, and the Navy probably fared better with less disease. There were at least 100 doctors in the Confederate Navy. While there may have been many "firsts" in the Civil War, there also was a "last" which occurred in the Navy. On 31 August 1862 the Federal Navy, with customary vision ended its grog ration in a fight against alcoholism.

At first glance the Civil War produced nothing more than hundreds of fetid hospitals and thousands of sorry amputations. But closer scrutiny reveals many significant "firsts" and an "incipient revolution" in American medicine that is still being felt in many areas today. A new kind of thinking developed that permitted objective inquiry into what went wrong; medical and surgical failures were reported and discussed for the first time; and post-mortem examinations were conducted for the first time on a large scale, fostering serious study for future application and decrease in medical illness. The concept of American nursing

evolved from an image of pesthouse attendant to that of a refined lady of compassion. Pharmacy graduated from mortar and pestle to sophisticated coils and kettles, the forerunners of modern-day production. The man in the street came to appreciate the true meaning of public health and by popular demand, doctors and many others did something about it. Many physicians and paramedical specialists distinguished themselves, and in the years to follow, set American medicine on its own feet. European citadels of learning would come to respect, and benefit from, the excellence of American medical knowledge that was soon to be recognized.

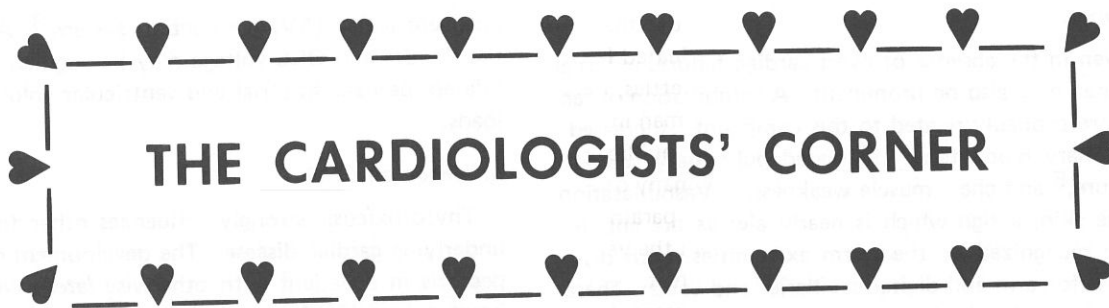
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THE CARDIOLOGISTS' CORNER

HORMONES and the HEART:

II. THYROTOXIC HEART DISEASE

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Thyrotoxicosis and myxedema are by far the most important endocrine diseases that affect the cardiovascular system. We have chosen to discuss the two conditions separately and have thoroughly reviewed myxedema heart disease in a previous article.¹ Use of the title thyrotoxic heart disease, unlike myxedema heart disease, engenders disquiet and confusion among many clinicians. The uncertainty results from attempts to group and separate clinical features associated with thyrotoxic heart disease, as distinct from findings attributed to hyperthyroidism occurring in young patients. This clinical dilemma is aptly phrased by Paul Wood: "The cardiovascular system is clearly involved from the onset of thyrotoxicosis, although the term thyrotoxic heart disease is usually reserved for the late stage when auricular fibrillation or congestive heart failure dominates the scene. Such a distinction is artificial . . ."²

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The opinions or assertions expressed in the above article are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Historically, the first case of thyrotoxic heart disease was described by Flajani in 1802; however, Parry (1815 and 1825) is credited with the first detailed description of the cardiovascular involvement. For further historical details, the reader is referred to the monographs of Cecil Joll (1932) and those of Means and Richardson (1938). In this article, we will review the effects of excess thyroid hormone on the circulation.

CIRCULATORY MANIFESTATIONS

Palpitations.

Palpitations commonly provoked by excitement or exercise represent the most frequent circulatory complaint of the thyrocardiac patient. The prominence of this symptom was first described by von Basedow of Merseburg, Germany in 1840. This finding represents the circulatory component of the Merseburg triad (palpitations, exophthalmos, and goiter). Palpitations can be related to increased heart rate, stroke volume and contractility, changes which singly or in combination can produce forceful precordial and peripheral pulses.³

Dyspnea.

Even in the absence of overt cardiac failure, external dyspnea may also be prominent. A combination of factors are probably related to this complaint: increased pulmonary blood flow,⁴ increased pulmonary arterial pressure,⁵ and chest muscle weakness.⁶ Vasodilatation in the skin, a sign which is nearly always present, is easily recognized by the warm extremities, with distended forearm and digital capillaries and veins. These effects, associated with reduced systemic and vascular resistance and increased skin blood flow⁷ are clinically appreciated as warm flushed skin, a widened pulse pressure (often referred to as "modified water-hammer pulse") and capillary pulsations. Cervical venous hum, a finding which should be differentiated from thyroid bruits, occurs frequently as a consequence of increased venous return.

Tachycardia.

Generally the tachycardia persists, even at rest and during sleep. Supraventricular tachyarrhythmias occur frequently and further contribute to the symptoms enumerated. In elderly patients, atrial fibrillation is a common manifestation which is difficult to control.

Physical Findings.

Precordial palpation reveals that the cardiac apical impulse is forceful. The heart sounds have a characteristic "slapping" quality and increased intensity. Ventricular gallops (S_3 and S_4) are common and relate to augmented diastolic filling; they do not necessarily imply myocardial failure in thyrotoxic patients. A systolic ejection murmur is often heard at the apex. Rarely a rumbling, diastolic murmur may be heard at the mitral area. In very hyperkinetic cases a "crunch" (Means-Lerman) may be heard at the pulmonic area. The latter finding is best heard at end-expiration; it is "scratchy," resembling a pericardial friction rub, and is thought to reflect the hyperkinetic pulmonary artery dilatation.

Laboratory Findings.

Generalized cardiac enlargement, dilated pulmonary arteries, prominent aortic arch, and plethoric pulmonary vascular beds are all probably related to the high volume flow (cardiac output), and may be demonstrated by *chest X-ray* studies. The *electrocardiogram* tracing may be within normal limits, unless it reveals sinus tachycardia or other supraventricular tachyarrhythmias. The ventricular rate is apt to be very rapid when atrial fibrillation occurs, since thyroid hormone markedly facilitates impulse transmission through the

atrioventricular (AV) conduction system.⁸ At times the P wave and QRS voltage may be augmented, also related, perhaps to atrial and ventricular volume overloads.

Influence on CHD.

Thyrotoxicosis strongly influences other forms of underlying cardiac disease. The development of angina pectoris in a patient with otherwise *latent coronary heart disease* (CHD) is a well-described example.⁹ Hyperthyroidism in the coronary heart patient favors the development of acute myocardial ischemia. Increases in myocardial oxygen consumption are induced by excess thyroid hormone, exposing the limitations in coronary blood flow distribution. Shortened duration of diastole secondary to tachycardia, as well as reduced systemic diastolic blood pressure (mechanical determinants of coronary flow), adversely affect the myocardial blood flow-oxygen demand relationship. Thyroxine may also inhibit myocardial anaerobic adenosine triphosphate (ATP) synthesis, thereby inhibiting appropriate metabolic adaptations to ischemia.¹⁰ Overt or "masked" hyperthyroidism should be excluded in all patients who present a recent onset, or refractory angina pectoris, or other unexplained manifestations of organic heart disease.

Catheterization Findings.

Catheterization studies in hyperthyroid patients demonstrate increased cardiac rate, output, work, oxygen consumption, and contractility.³ Cardiac output changes are primarily a result of tachycardia, since increases in stroke volume are usually minimal. Blood flow (cardiac output) is augmented in excess of the increased peripheral oxygen demands, since the aorto-venous oxygen difference is actually narrowed. This discordant finding suggests: either arteriovenous shunting (peripheral vascular resistance is decreased), enhanced cardiac sympathetic (beta) responses, or block in oxygen uptake (similar to cyanide poisoning), acting separately or in combination. During stress, such as exercise, all of these parameters are inappropriately increased.¹¹

We have shown that the exaggerated heart rate response is particularly deleterious.^{12,13} This capricious response effects a disproportionate increase in myocardial oxygen consumption as compared to left ventricular work. Considering the ratio of heart work to energy consumption (an index of cardiac efficiency), these exaggerated changes in myocardial oxygen requirements, relative to external left ventricular work reflect the left ventricular inefficiency in hyperthyroidism.

ADRENERGIC ACTIVITY

A number of studies have recently confirmed that thyroid hormone has a direct augmenting effect on the heart.¹⁴ It is unclear, however, whether such circulatory changes result from immediate direct cellular effects of thyroid hormone alone, or as a result of hypermetabolic by-products (reduced pO_2^* and pH ,[†] increased temperature, etc.), excessive adrenergic stimulation, or enhanced sympathetic sensitivity (Table I). Support for augmented sensitivity to catecholamines is related to the original "Goetsch Test,"¹⁵ i.e., blood pressure is more augmented by epinephrine in thyrotoxic subjects than in normal persons. To clarify the influence of adrenergic activity, we analyzed the effects of selective alpha- and/or beta-adrenergic blockade on the central and peripheral circulatory responses of thyrotoxic patients.**

Beta-adrenergic Blockade.

Beta-sympathetic blockade produces rapid attenuation of hyperkinetic cardiac responses and their related symptoms. With propranolol (Figure 1), there is slowing of the resting heart rate and reduction of myocardial contractility, reflected by a decrease in the rate of left ventricular pressure development. Propranolol also reduces the pulse pressure, while mean systemic

TABLE I

POSSIBLE MECHANISM OF ACTION OF THYROID HORMONES ON THE MYOCARDIUM

Direct Action

- Induce mitochondrial high energy phosphate synthesis²⁴
- Increase myocardial molecular (mostly protein) synthesis²⁵
- Stimulate myocardial adenyl cyclase activity²⁶
- Alter membrane ATPase²⁷

Indirect Action

- Secondary to increased peripheral oxygen utilization or other metabolic consumption²⁸
- Increased myocardial sensitivity to catecholamines²⁹

*partial pressure of oxygen
†hydrogen ion concentration

**Study performed under Navy Bureau of Medicine and Surgery Work Unit MR005.20.01-0145A.

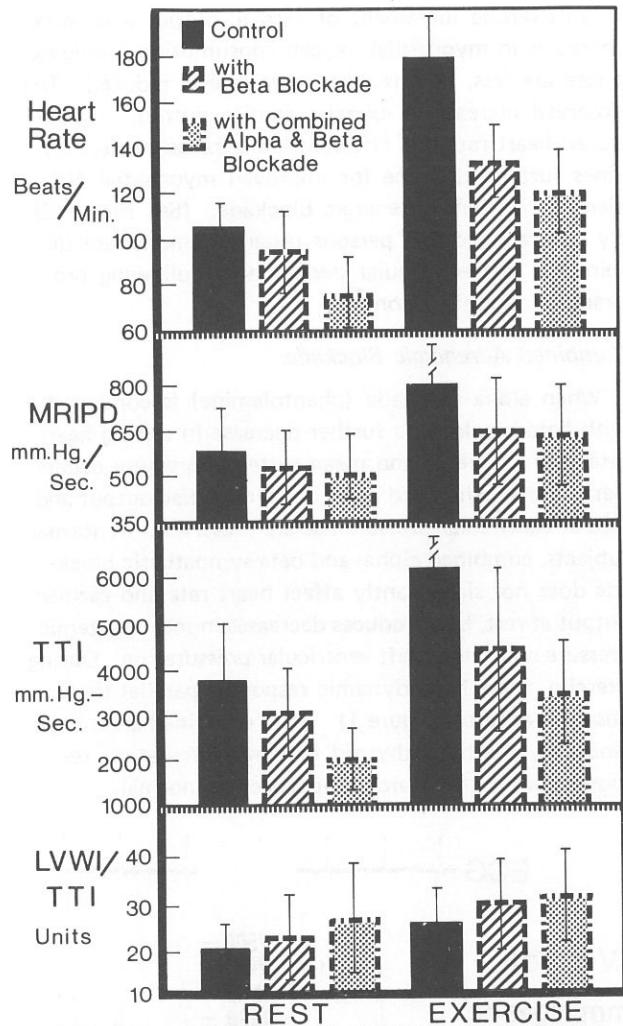


Figure 1.—EFFECTS OF ALPHA AND BETA-ADRENERGIC BLOCKADE ON CARDIOVASCULAR RESPONSES OF THYROTOXIC PATIENTS. Thyrotoxic subjects, given no drugs at all served as controls. Chronotropic effects are illustrated by heart rate changes. Inotropic responses are represented by the mean rate of left ventricular isovolumetric pressure development (MRIPD); changes in myocardial oxygen consumption are reflected by tension time index (TTI); left ventricular efficiency is estimated as the ratio of left ventricular work index (LVWI) to TTI (LVWI/TTI). (This graph is reprinted here by special permission of MEDICAL TIMES publication.¹²)

pressure and resistance increase. The heart rate and contractility responses to exercise stress are also significantly decreased.

Propranolol alters exercise hemodynamic responses in hyperthyroid patients differently than in the case of euthyroid subjects. (See Figure 1, right panel) This results because, compared to normal subjects, hyperthyroid patients demonstrate more negative chronotropic effects of beta inhibition than negative inotropism. Consequently, control of unrestrained tachycardia produces an increase in stroke volume, resulting

in an exercise increment of cardiac output and work. Increases in myocardial oxygen consumption during exercise are less, because the heart rate is reduced. The observed increase in exercise cardiac output, at a reduced heart rate and left ventricular pressure rise, provides further evidence for improved myocardial efficiency with beta-adrenergic blockade. (See Figure 2) By contrast, normal persons usually demonstrate diminished left ventricular performance following propranolol administration.¹⁶

Combined Adrenergic Blockade.

When alpha blockade (phentolamine) is combined with beta blockade, a further decrease in resting heart rate (See Figure 1) and mean systemic pressure occurs. Beta blockade-induced reductions in cardiac output and rate of ventricular-pressure rise are preserved. In normal subjects, combined alpha- and beta-sympathetic blockade does not significantly affect heart rate and cardiac output at rest, but produces decreases in mean systemic pressure and rate of left ventricular pressure rise. During exercise, these hemodynamic responses parallel those observed at rest. (Figure 1) After combined adrenergic blockade, the hyperthyroid patient's circulatory responses are more retarded, approaching normal.

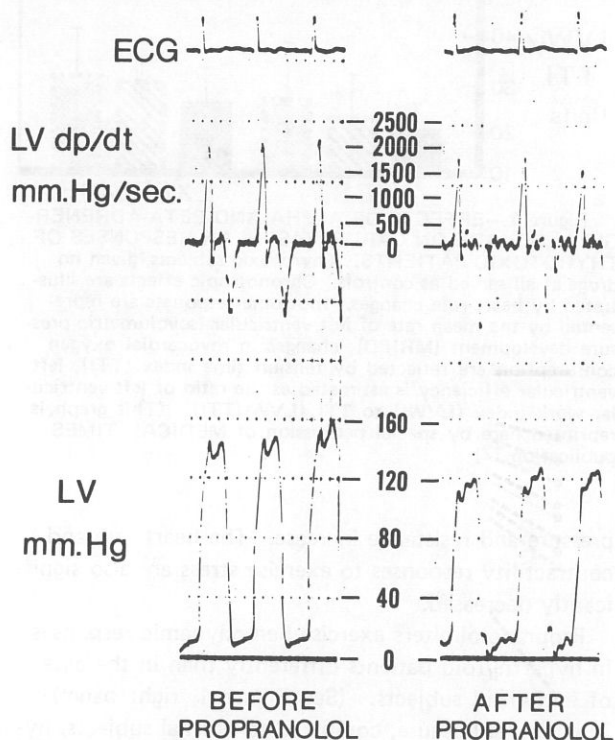


Figure 2.—LEFT VENTRICULAR HEMODYNAMIC RESPONSE TO PROPRANOLOL IN A THYROTOXIC PATIENT. Rate of rise of left ventricular pressure (dp/dt) decreases following propranolol. (This figure is reprinted by special permission of MEDICAL TIMES publication.¹²)

Concomitant with these hemodynamic alterations, associated symptoms are alleviated in the thyrotoxic patient. He no longer complains of palpitations or dyspnea. Warm, flushed and moist skin, and increased pulse pressure are no longer prominent. However, some minimal signs may persist (i.e. heart rate remains about 10% above normal), implying that the circulatory effects of excess thyroid hormone are not totally catecholamine-dependent and that other factors do contribute.

Other Effects of Sympathetic Blockade.

Recent studies in our lab,¹⁷ and others, have demonstrated that neuromuscular manifestations such as tremor, hyperkinesia, hyperactive tendon reflexes, muscle weakness,¹⁸ eyelid retraction,¹⁹ inability to concentrate and irritability are also improved or eliminated following pharmacologic sympathetic blockade. (See Figure 3) We have shown that some of the metabolic manifestations of thyrotoxicosis are suppressed with alpha and beta blockade.^{12,17} There are conflicting reports about the effects of automatic blockade on oxygen consumption. Our observations indicate that significant reductions of total body oxygen consumption occur when alpha- and beta-blocking agents are administered over an extended period (i.e. two months). (See Figure 4) In addition, we have noted a mean increase in body weight in hyperthyroid patients after prolonged complete sympathetic blockade.

TREATMENT OF THYROTOXIC HEART DISEASE

The basic processes of anti-thyroid therapy are well known and will not be recounted here. The circulatory signs and symptoms of thyrotoxicosis can be completely ameliorated by both thyroid obliteration (radioiodine or surgery) or pharmacologic inhibition. Effective use of definitive therapy imposes a considerable time lag, during which many patients remain symptomatic, and which some cardiovascular systems tolerate poorly. Propranolol, phenoxybenzamine, and other adrenergic-blocking agents are clinically desirable during this period because of their prompt and specific effects. Precise titration for the symptoms presented by each patient is possible without affecting thyroid-function tests. In general, propranolol (Inderal) is initiated orally at a dose of 40 mg given four times daily. With phenoxybenzamine (Dibenzylamine), 10 mg given twice daily is the usual dose. The dosage of both drugs is increased at two- to three-day intervals until the clinical signs of thyrotoxicosis are controlled. The usual maintenance doses are: 80-120 mg propranolol, four times daily; and 10 mg

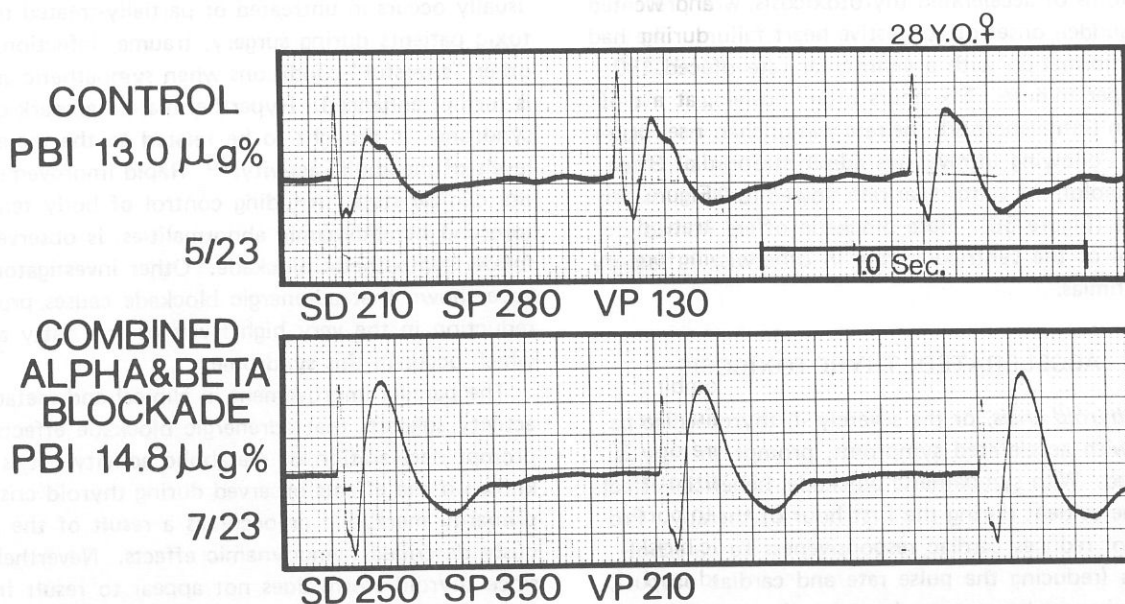


Figure 3.—KINEMOMETRIC RESPONSE (ACHILLES TENDON REFLEX) TO COMBINED ALPHA- AND BETA-SYMPATHETIC BLOCKADE. These records were made at a speed of 50 mm/sec.; thin lines are spaced 0.02 sec. apart. The initial sharp deflection represents stroke of reflex hammer. SD = time of onset to end of Achilles tendon reflex; SP = time of onset to peak of relaxation; VP = time for maximum contraction to maximum relaxation. Blockade causes significant prolongation of the SP and VP intervals (toward normal) in hyperthyroid patients. No significant change occurred in controls. (This figure is reprinted here by special permission of MEDICAL TIMES publication.¹²)

phenoxybenzamine, three to four times daily. We have continued this treatment schedule for three- to four-month periods when necessary. Long-term usage of sympathetic blocking agents (i.e. phenoxybenzamine in hypertensives and propranolol in angina patients) indicates that these agents are well tolerated for prolonged periods. This form of sympatholytic therapy can be particularly valuable, affording dramatic circulatory and symptomatic improvement until vital tests are initiated, and suppressing hyperthyroid effects until the action of conventional anti-thyroid therapy (radioiodine or surgery) becomes evident.

Thyrocardiac patients with associated congestive heart failure are relatively refractory to conventional anticongestive measures, including digitalis. Although standard treatment (bed rest, dietary salt restriction, diuresis, etc.) should be utilized in these seriously ill patients, improvement generally occurs only after the thyrotoxic state is attenuated.

Other clinical situations associated with the management of thyrotoxic patients warrant special consideration. Supraventricular tachyarrhythmias, characteristically paroxysmal atrial fibrillation in elderly thyrotoxic patients, can introduce a challenging clinical problem. These life-threatening arrhythmias may also precipitate refractory congestive heart failure. We recently observed a 62-year-old woman with signs and

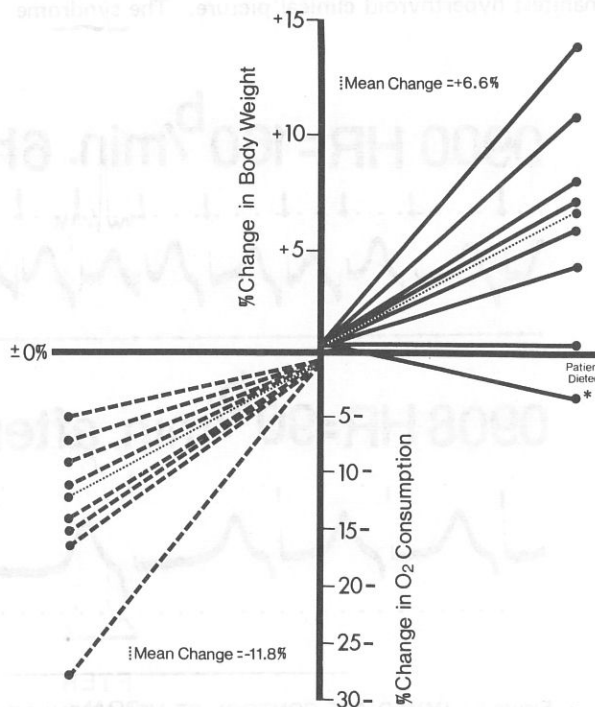


Figure 4.—EFFECT OF COMBINED ALPHA AND BETA BLOCKADE ON BODY WEIGHT AND OXYGEN CONSUMPTION IN HYPERTHYROID PATIENTS. Blockade causes a significant reduction in oxygen consumption and an increase in body weight. (This figure is reprinted here by special permission of MEDICAL TIMES publication.¹²)

symptoms of accelerated thyrotoxicosis, who presented with sudden onset of congestive heart failure. She had atrial fibrillation with a ventricular rate of 160-180 beats per minute. Six hours after receiving 1 mg of digoxin (intravenously), the rate was unchanged (Figure 5A). Following intravenous administration of 3 mg propranolol, the ventricular rate slowed to 90 beats per minute (Figure 5B). Beta blockade offers immediate control of the ventricular rate in otherwise refractory arrhythmias.

ACCELERATED THYROTOXICOSIS

In *thyroid crisis*, or the severely ill thyrocardiac patient with accelerated symptoms, prompt therapy is required. With sympathetic blockade, beneficial effects become evident during the first hour of therapy. Propranolol reduces cardiac responsiveness to catecholamines (reducing the pulse rate and cardiac output), while phenoxybenzamine decreases the vascular and tissue responsiveness to catecholamines (decreases the systemic blood pressure and pulse pressure). Combined, these agents reduce oxygen consumption and hyperactivity.

Thyroid storm generally includes fever and central nervous system dysfunction associated with a more manifest hyperthyroid clinical picture. The syndrome

usually occurs in untreated or partially-treated thyrotoxic patients during surgery, trauma, infection, or other "stressful" conditions when sympathetic activity is further enhanced. Hyperthermia, a hallmark of this syndrome, is thought to be related to the increased levels of metabolic activity.²⁰ Rapid improvement in the clinical state, including control of body temperature and hemodynamic abnormalities, is observed to follow sympathetic blockade. Other investigators²¹ have shown that adrenergic blockade causes prompt reduction in the very high levels of free fatty acids which occur in this syndrome.

The parallel improvement in clinical and metabolic activity suggests that adrenergic blockade effects a prompt deceleration of metabolic activity. It is not known if the effects observed during thyroid crisis are primarily metabolic or occur as a result of the previously described hemodynamic effects. Nevertheless, since thyroid storm does not appear to result from a massive increase in rate of release of thyroid hormones, but rather is usually precipitated during situations of enhanced sympathetic activity,²² sympatholytic blockade appears to provide prompt, effective therapy in these "life-endangering" situations.^{20,23} Because the effects of saturated solution of potassium iodide (Wolff-Chaikoff effect) will not become evident for 24-48 hours, adrenergic blockade may be lifesaving.

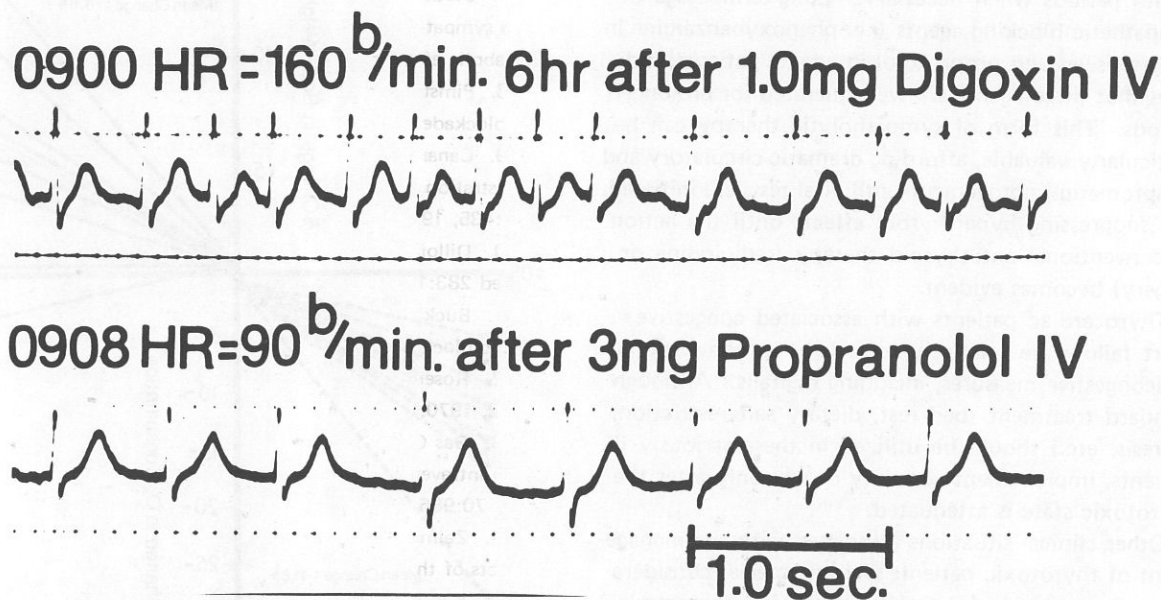


Figure 5.—IMMEDIATE CONTROL OF VENTRICULAR RATE BY BETA BLOCKADE IN THYROTOXIC PATIENTS WITH ATRIAL FIBRILLATION.

Top tracing (A) represents electrocardiogram record obtained six hours following intravenous digoxin, 1 mg.; ventricular rate is 160-180 beats per min.

Bottom tracing (B) represents electrocardiogram record obtained eight minutes following intravenous propranolol, 3 mg.; ventricular rate is 90 beats per min.

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Contraindication.

Caution should be exercised when adrenergic blocking agents are used in patients with abnormalities of atrioventricular conduction associated with thyrotoxic myocarditis or other underlying heart disease. In patients with advanced A-V block, brachycardia, or heart failure, these agents are contraindicated. This is also true for patients at risk to bronchospasm or orthostatic hypotension.

Prognosis.

"There are few forms of heart disease that respond better to adequate treatment than thyrotoxic heart disease."² Dramatic improvement, even in seriously ill cases with gross congestive heart failure, established atrial fibrillation, and a variety of other findings may be cured. It is not uncommon even for large hearts to resume normal size. On the other hand, if the disease remains untreated, heart failure and death are inevitable.

CONCLUSION

In hyperthyroidism, a hyperkinetic circulatory state exists which resembles that observed under conditions of excess adrenergic activity. These effects are particularly pronounced during exercise and other maneuvers which further enhance sympathetic activity. Definitive antithyroid therapy reverses these cardiovascular findings. Adrenergic blockade therapy can be used to promptly alleviate many of these symptoms while waiting for the effects of specific thyroid therapy to become apparent. In patients with accelerated thyrotoxicosis, adrenergic blocking agents provide significant, sometimes lifesaving circulatory improvement.

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JOINT U.S. — ICELANDIC MEDICAL CONFERENCE

On 7 Nov 1972, CAPT James M. Young, MC, USN, from the Naval Hospital Boston, Chelsea, Mass., addressed a large group of Navy and Icelandic physicians at the Officers' Club, Keflavik, Iceland. His main topic, "Diabetes and Hypertension," was presented from the perspective of preventive medicine. Dr. Young's presentation was most revealing and well received. Dr. Tomas A. Jonasson, Educational Secretary for the Icelandic Medical Society, expressed his gratitude to Dr. Young and CAPT Jerome Levy, MC, USN, Staff Surgeon for the Icelandic Defense Force, for an enlightening and worthwhile conference.

The following day Drs. Young and Levy traveled to St. Joseph's Hospital, Reykjavik, Iceland, where Dr. Young addressed another group of staff physicians and medical students from the University of Reykjavik's Medical School. His topic, "Oral Hypoglycemic Agents — A Controversial Mode of Therapy," was regarded by the entire audience as a stimulating and informative choice.

These joint medical conferences are held every quarter and are a part of the Icelandic Defense Force Intercultural Program. The program seeks to develop and maintain rapport, communications, and fellowship with the Icelandic community. Medical officers attached to the U.S. Naval Station Dispensary, Keflavik, also attend periodic conferences sponsored by the Icelandic Medical Association, conducted at the larger hospitals in Reykjavik, Iceland. Prominent U.S. Navy medical officers have contributed to the success of the program. Previous speakers have included CAPT J.T. Mullin, MC, USN, Chief of Surgery and CAPT B.L. Arons, Peripheral Vascular Surgeon, both from the Naval Hospital Portsmouth, Va.

Dr. Young is presently the Chief of Medicine, Director of Interns and Graduate Training Program at the Naval Hospital Boston. He is also an Associate Professor of Medicine at Boston University. He has previously served as a White House Physician, and as a



JOINT MEDICAL CONFERENCE — CAPT James M. Young, MC, USN (left), Chief of Medicine, Naval Hospital Boston, Chelsea, Mass., addressed the Fourth Joint U.S. — Icelandic Medical Conference. Standing on the right is CAPT Jerome Levy, MC, USN, Icelandic Defense Force Staff Surgeon and Senior Medical Officer, U.S. Naval Station, Keflavik, Iceland.

member of the staff at the National Naval Medical Center and Naval Hospitals Bethesda, Philadelphia, and Oakland.—LT(jg) Warrell F. Leadbeater, MSC, USN; Medical Administrative Officer, U.S. Naval Station Dispensary, Keflavik, Iceland. ☞

LEISHMANIASIS in Panama

By CDR Robert J. Kinney, MC, USN,* and
CDR Ralph R. Palumbo, MC, USN**

Leishmaniasis in Panama is basically a zoonosis of forest animals caused by several species of *Leishmania*, a protozoan parasite which infects the skin of its host. *Leishmania braziliensis* has been cultured from a variety of animals, whereas only a small number of rodents from an area of Northwest Panama have been found infected with *Leishmania mexicana*. A recently described species, *Leishmania hertigi*, has been repeatedly recovered from the tropical porcupine. The latter infection does not cause skin lesions in these hosts.

Up to the present time, only *L. braziliensis* has been implicated in human infections in Panama. If man invades and disturbs the environment, particularly around tree buttresses on the jungle floor or up in the canopy, he may become an accidental host of this organism. Transmission occurs by the bite of several species of sandflies during a blood meal.

CLINICAL FINDINGS.

The most frequent lesions of human cutaneous leishmaniasis begin on exposed surfaces (arms, legs, face or trunk if not clothed) as tiny erythematous nodules

which may be single or multiple. The onset may be as early as three weeks and as long as three months after exposure, but most commonly, it is three to five weeks. Over the next several weeks the nodule enlarges, becoming papular and shiny, until it reaches about 1 cm in diameter; at this time the center breaks down and appears necrotic, probably due to an impaired blood supply to the skin in that area. The lesions may be slightly pruritic, but are almost never painful. It is usually at this time that the patient seeks medical attention. If no treatment is instituted, the lesion rapidly enlarges by several more centimeters, becoming round or elliptical with an elevated and rolled border (Figure 1). Secondary bacterial infection is common. At the base of the crater there is usually reddish granulation tissue covered with either necrotic material or a dry brownish-white crust which may be easily removed with forceps after soaking in warm soapy water. If the patient is treated by himself or non-medical personnel, the crater may take on a variety of appearances and become severely infected. At this time chains of lymph nodes, measuring about 0.5 cm. in diameter, are commonly found by carefully palpating appropriate areas; these represent local extension.

Metastasis to the mucous membranes of the mouth, nose, and throat may occur in untreated cases, although it is not seen as commonly in Panama as in other South American countries. This is called mucocutaneous leishmaniasis and is associated with a variety of lesions, such as perforated septum, or loss of the

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**District Medical Officer, 15th Naval District Headquarters, P.O. Box 5037, FPO New York 09580.

The opinions or assertions expressed in the above article are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

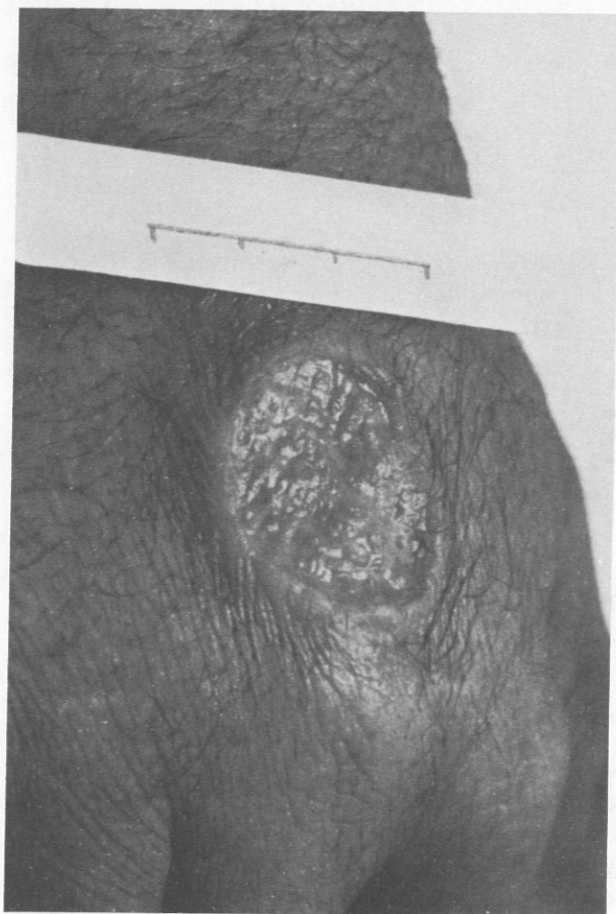


FIGURE 1.—Typical lesion of leishmaniasis on the dorsum of the hand, approximately six weeks in duration.

uvula or epiglottis, with replacement by chronic granulomatous tissue. With very extensive involvement, asphyxiation secondary to aspiration has been seen in Panama. Blood-borne metastasis, though rare, does occur. Multiple lesions, which are younger than the original one(s) may suddenly appear over extensive areas of the body and enlarge simultaneously.

Destructive lesions of the ear, particularly the tragus, have been observed and resemble the so-called chiclero ulcer, which occurs principally among the chicle gum gatherers of Mexico where the infectious agent is *L. mexicana*. Systemic leishmaniasis (kala-azar) caused by *Leishmania donovani* has not been reported in Panama.

DIAGNOSIS.

The diagnosis of leishmaniasis is confirmed only by identification of the parasite through scrapings, needle aspiration, biopsy or culture. The first method is the simplest and will be the only one discussed. After cleansing, the lesion is scraped 1-2 mm. outside the crest of the rolled border and parallel to it, for a

distance of about a centimeter, with the tip of a scalpel or other sharp instrument (Figure 2). This area is used because the parasites are found only in the retreating epidermis. The skin is denuded carefully until serum begins to appear. This serum should be as free from blood as possible to facilitate finding the parasites. Clean glass slides are then pressed against the area to remove the serum (Figure 3), which is allowed to dry. The smears are then stained with a Romanowsky (Giemsa) stain using a thick film technique to cause hemolysis of any red cells. All *Leishmania* appear the same under the light microscope and must be diligently sought. They are round or ovoid organisms, about 2 to 5 micra in diameter; containing a relatively peripheral nucleus with an adjacent, small, very dark kinetoplast; both of which stain reddish-purple, in contrast to the cytoplasm that stains blue. It should be noted that with biopsy, *Leishmania* are intracellular; but by the scraping technique, epidermal cells and macrophages are disrupted and the parasites become extracellular. The organisms are most easily demonstrated in early

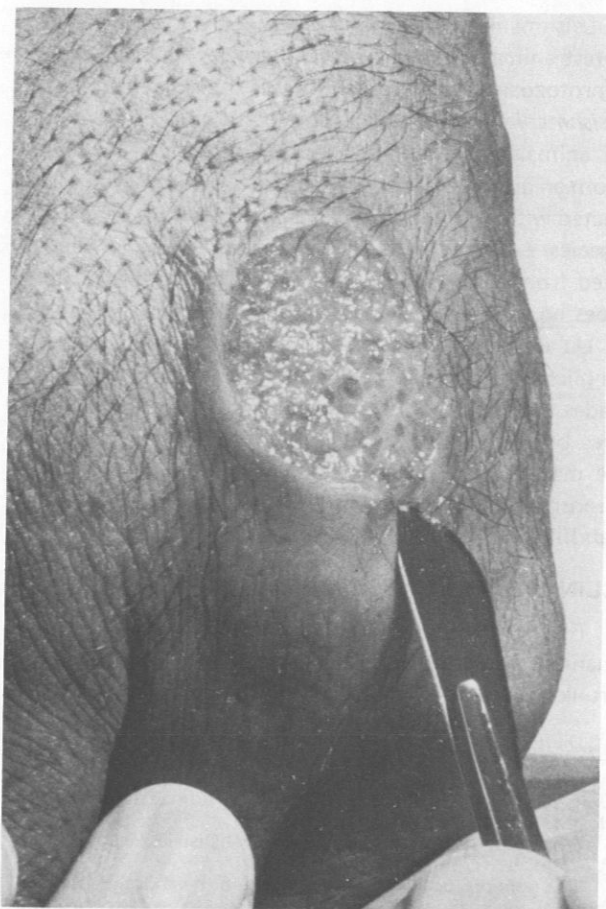


FIGURE 2.—The lesion is scraped just outside the crest of the rolled border and parallel to it.

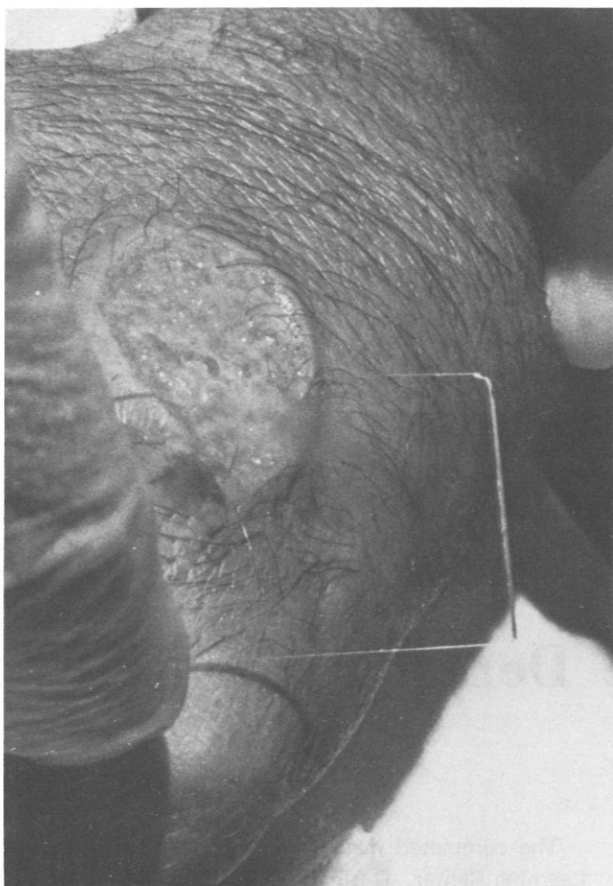


FIGURE 3.—The serum, containing disrupted cells is removed on a clean glass slide.

lesions which are not secondarily infected. It may be necessary to administer a ten-day course of tetracycline and have the patient wash the lesion frequently with warm soapy water, prior to the scraping procedure, in order to demonstrate the parasites.

Ancillary diagnostic procedures include the leishmanial (Montenegro) intradermal test and the indirect fluorescent antibody examination of serum, but these are not generally available in the United States.

In Panama the differential diagnosis includes leprosy, yaws, syphilis, and sporotrichosis.

TREATMENT.

The susceptibility of leishmanial organisms to drugs may vary somewhat according to geographic locality,

but in Panama the use of the pentavalent organic antimonial, sodium antimony gluconate (Pentostam — available from the Communicable Disease Center, Atlanta, Ga.), has been found to be very effective. It is given intramuscularly, three times weekly for ten doses; well over 90% of the patients respond and if a second course is necessary, almost 100% response has been observed. Side effects and toxicity are low. Another drug that has been effective in about 70% of Panamanian Leishmania strains is cycloguanil pamoate (Camolar — Parke, Davis and Company). This is suspended in an oleaginous vehicle of 40% benzyl benzoate and 60% castor oil, to slow absorption. Thus the drug can be given in a single intramuscular injection in the buttock. The average adult dose is 350 mg. In cases where the patient cannot tolerate these drugs or where there is no response, pyrimethamine (Daraprim — Burroughs Wellcome) 25 mg. twice daily can be given.

Hypopigmented but otherwise normal skin ordinarily begins to replace granulation tissue within several weeks after therapy is begun. Complete regression usually occurs in three to four weeks, but varies in relation to the age and size of the lesion.

Acknowledgment: The authors wish to thank Dr. Carl Johnson and Dr. Aristides Herrer for their kind assistance in the preparation of this manuscript.

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FIRST SITE TV INSTALLED

Installation of the Navy's first "Shipboard Information, Training and Entertainment (SITE)" closed-circuit color television system is now in operation. By the end of FY 1975, 139 Navy ships will have installed the CHINFO-sponsored SITE System. ☸

INDEPENDENT LEARNING CENTER

Naval Graduate Dental School

In its educational programs, the Naval Graduate Dental School has used many teaching methods — slide-illustrated lectures, motion pictures, television, and other media. Now the School offers another method, "Individualized Instruction."

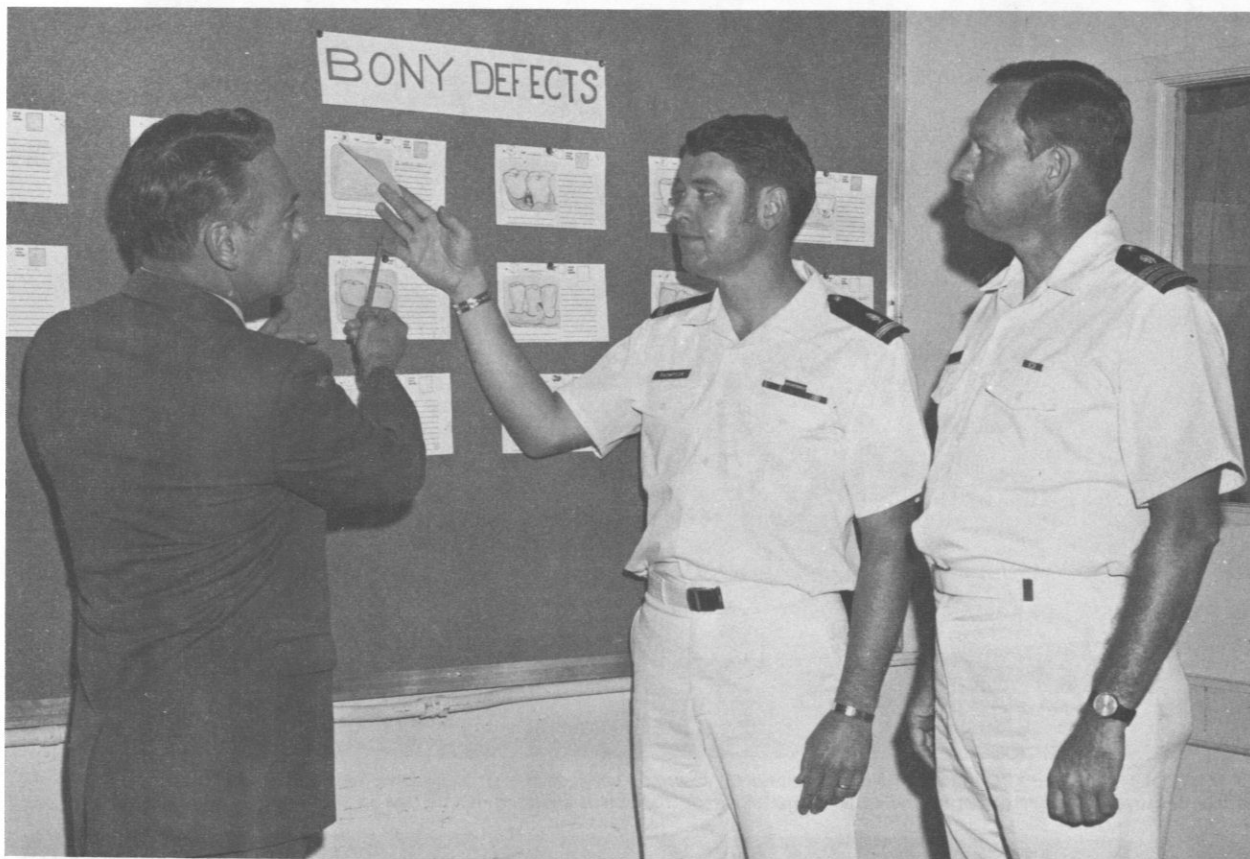
Educators have long known that students learn at different rates, that most have disparate abilities in grasping different concepts, and that all have diverse peaks of alertness throughout each day as well as during the academic year. Unfortunately, traditional methods of teaching by lectures, seminars and laboratory exercises forced the instructor to adapt his presentations to the level of students who had the most difficulty with each concept, and to repeat the same basic material to each incoming class. This resulted in a loss of valuable classroom time both for the instructor and for many students.

As research continued to expand available knowledge and as the numbers of students increased, educators began to explore ways of providing more learning in less time. The latest technique is the single-concept learning program, where basic material from each course is broken down into single concepts, each of which is packaged in the medium best suited for its presentation, such as a motion picture, an audio-tape synchronized with individual slides, a tape recording to be used in combination with an illustrated booklet, etc.

The completed media are filed in an Independent Learning Center. During a lecture, the instructor may say, for example, "Tomorrow we will discuss the classification of bony defects, which is covered by program 1234 in the ILC." Each student, at his own convenience, can then go to the Independent Learning Center, check out the program, take it to one of the carrels, and study until he has a thorough understanding of the subject. This allows the instructor to spend valuable classroom time in clarifying fine points and in consulting with the students. He need not repeat basic facts or conduct reviews, for students can check out the programs again at any time, should they desire to review a subject. If a student wants to investigate any subject in greater depth, he can obtain supplementary materials in the ILC or in the adjacent professional library.

The Naval Graduate Dental School encourages all its instructors to package their presentations. In doing so, they are assisted by the staff of the Learning Resources Division and the Publications Division of the Educational Resources Department.

When an instructor goes to the Learning Resources Division for assistance, he first works with the staff in exploring all available sources of existing media suitable for graduate level educational programs. For example, an instructor in periodontics may want to prepare single-concept programs on the diagnosis and treatment



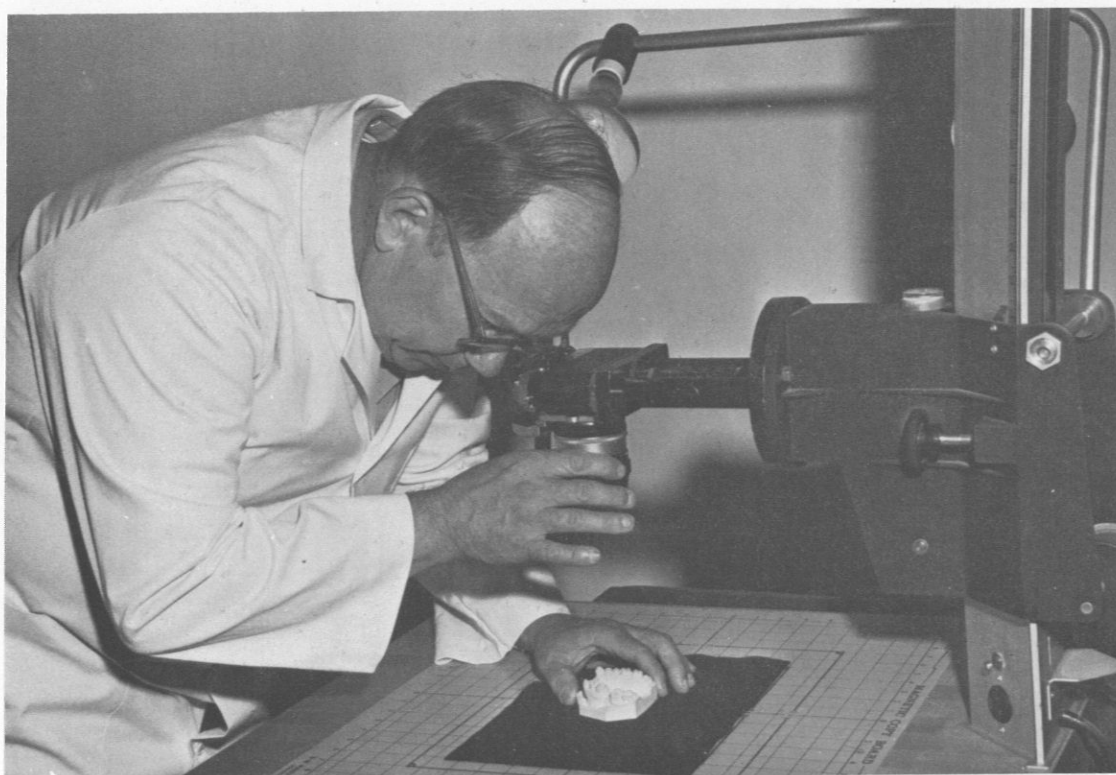
PACKAGE ON A STORY BOARD — Mr. Robert F. Stroud (left), Chief of the Learning Resources Division, discusses a new learning package with CDR Samuel V. Holroyd, DC, USN (right), head of the Educational Resources Department; and ENS Ron Thompson, MSC, USN (center), assistant head of the department. The script for the unit is outlined on cards, on which the illustrations are sketched. The cards are then arranged on a "story board," where the entire unit can be examined at once. Instructors can easily add, subtract, or rearrange material as necessary.

of infrabony periodontal pockets. Single-concept motion pictures of the different operative procedures are available commercially in 8 mm film cartridges for use with individualized film viewers, and these may be purchased. If no suitable aids are found for other parts of his presentation, however, they must be prepared. The instructor is asked to define his objectives as specifically as possible. Since the choice of operative procedure is influenced by the remaining walls of alveolar bone surrounding the periodontal pocket, one specific objective would be, "to enable the student to classify and describe each type of osseous defect." A script is then written, edited, and polished; the staff works with the instructor to determine what visual aids will be required and what medium will be most suitable for the presentation.

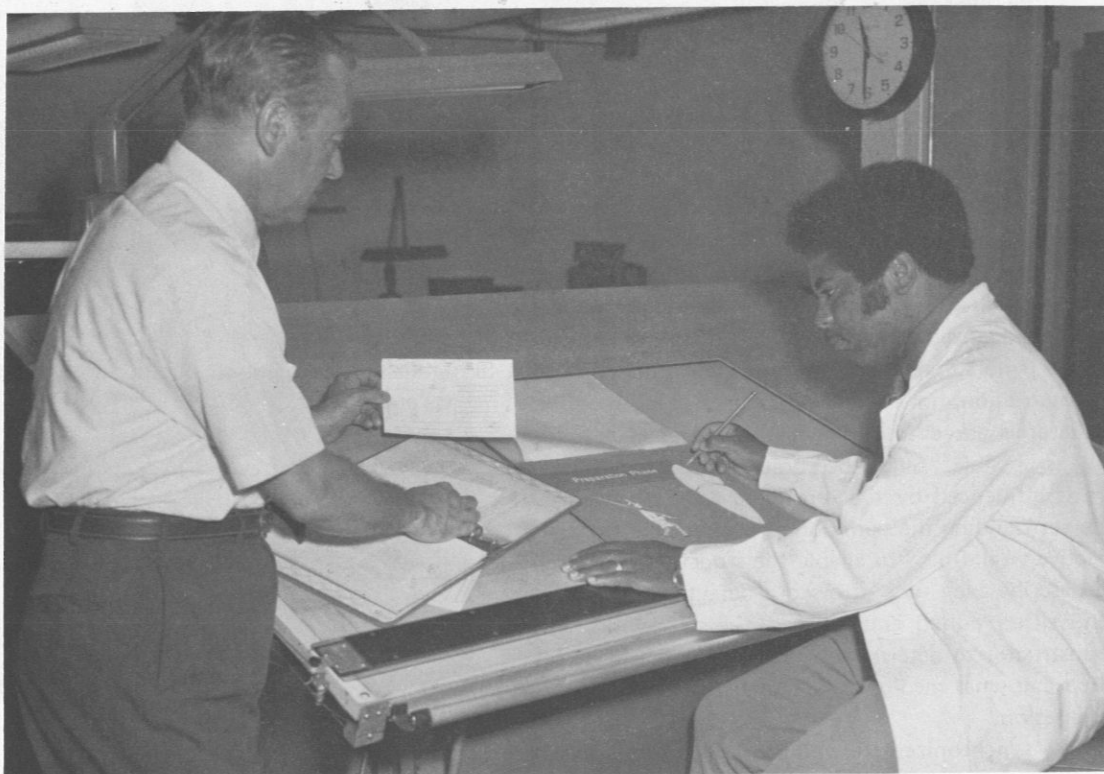
For a synchronized slide/audio tape presentation, visual aids are prepared and converted into 35 mm slides; then the script is tape recorded. Impulses put on the tape change the slide projector automatically



YOUR CHOICE OF MORE THAN 55,000 SLIDES — Ms. Rose Prakas, Learning Resources Media librarian selects slides from the master file that contains over 55,000 slides, which instructors may use to illustrate their programs. If a slide is required which is not available, either the photographic laboratory can prepare one, or the instructor may obtain cameras and film to photograph the desired subject himself.



PHOTOGRAPHIC EXPERTISE — Mr. Raymond M. Oswald, head of the photographic laboratory photographs models, illustrations, charts, graphs and other visual aids, and reduces them to slides for use in the learning programs.



COORDINATING ILLUSTRATIONS — Mr. Stroud (left) and Mr. Ernie Walker (right), illustrator, discuss an illustration for a new program. If a concept cannot be illustrated with a photograph, as in the case of internal structures, Mr. Walker prepares illustrations depicting the desired information.



STUDENTS AT WORK — Students study at carrels in the Independent Learning Center. Most carrels are equipped with a slide projector and screen, a synchronizing cassette player, and headphones. The Center also has carrels with individualized viewers for motion picture cartridges, and an area where four or five students can study together.

at appropriate times. If necessary, additional copies of the presentation are made and the "program" is filed in the ILC.

The single-concept programs now being made consist of 35 mm slides and a tape cassette. Currently, the Learning Resources Division is working on 12 projects, and 30 more are in the planning stage. Future plans are to adapt other media for use in the Learning Center, such as 16 mm films and projectors, videotapes, models, self-scoring testing materials and color video-cassettes for television viewing. It is also hoped that the programs can eventually be produced in quantity

so that they can be made available to other naval dental facilities, for educators have found that the self-instructional method of learning leads to greater retention of subject matter.

In addition to the Independent Learning Center, the Learning Resources Division is responsible for the correspondence course program, the professional library, and all audiovisual services. Dr. Ernest F. Moreland of the University of Maryland Dental School in Baltimore, a pioneer in the application of individualized instruction to dentistry is serving as a consultant to the staff.—
PAO, NNMC, Bethesda, Md. 🇺🇸

"ALL HANDS" CIRCULATION INCREASED

BUPERS has announced that the distribution of "ALL HANDS" magazine is being doubled, beginning with the Feb 1973 issue. All ships and stations will now receive sufficient copies to provide one for every five personnel. CNO and CHNAVPERs recently authorized the distribution increase in response to numerous requests received from personnel throughout the Navy. 🇺🇸



RESERVE DRILL PARTICIPATION

One of the areas of primary concern in the Naval Reserve Medical Program has always been the meaningful participation of reservists in useful activity during regular drills. The classroom setting and the structured program which accompanies it have come to typify the Medical Company drill. The consensus is that this method of drill is one which begs improvement.

In July 1971, the Bureau of Medicine and Surgery proposed some new approaches toward the solution of both the problem of worthwhile participation, and reserve recruiting and retention, to the Chief of Naval Operations. The most significant of the proposals was a recommendation to allocate a number of new pay billets to each medical company which could furnish support to a naval hospital. This particular suggestion was approved and nine medical units, located in close proximity to naval medical facilities were authorized ten pay billets each, to be used by those individuals who would agree to drill as members of the naval hospital staffs in lieu of meeting with the medical company. After a rather slow beginning the program gathered a great deal of momentum and acceptance in both the regular Navy and Naval Reserve medical communities. The units involved and the medical facilities they were designated to support are:

MEDICAL COMPANY	NAVAL HOSPITAL or REGIONAL MEDICAL CENTER
1-1	Chelsea, Boston, Mass.
3-4	St. Albans, NY.
4-3	Philadelphia, Penn.
5-6	Bethesda, Md.
6-7	Memphis, Tenn.
9-27	Great Lakes, Ill.
11-1	Long Beach, Calif.
11-6	San Diego, Calif.
12-6	Oakland, Calif.

This arrangement affords certain, selected Naval Reserve Medical Department officers an opportunity to perform drills in their specialty, and at the same time augments the staff at naval hospitals during periods of personnel shortages and increased workload.

Contributory support at naval hospitals and regional medical centers is only one new innovation. Naval Reserve Medical Company 3-5, Elizabeth, N.J., for example, has introduced a form of contributory support in which units located at some distance from active naval activities can participate. CDR Fred Primich, MC, USNR-R, the Commanding Officer, organized and established NRMCMC 3-5 with the idea that it would engage in contributory projects rather than in a lecture program. The unit's first projects involved a staff study of medical supply and equipment allowances for Naval Reserve Centers and development of a manual for use by Commandants' Representatives at medical schools. The Medical Program Officer, Third Naval District assists in identifying meaningful tasks, and provides support as necessary. Enlisted members of the company are receiving training in specialized medical care areas, through local civilian hospitals, thanks again to the efforts of the commanding officer. Though this beginning is a modest one, the idea has a great deal of potential, and has gained a great deal of local support.—Code 36A, BUMED. ¶

SIGHT CONSERVATION

Effective 1 Jan 1972 a Food and Drug Administration (FDA) ruling required that all eyeglass and sunglass lenses be impact-resistant. This represents a significant step forward as it protects the eyes of the general public.

HOWEVER, THE FDA TYPE LENSES ARE *NOT* THE EQUIVALENT OF INDUSTRIAL QUALITY SAFETY LENSES THAT ARE REQUIRED IN COMPULSORY EYE-PROTECTION AREAS.

These glasses do not meet all of the requirements stipulated in the document "American National Standard Practice for Occupational and Educational Eye and Face Protection, Z87.1, 1968." This standard specifies that industrial safety lenses must be at least 3 mm in thickness and capable of withstanding an impact from a one-inch diameter steel ball dropped 50 inches.

The FDA regulation does not mention lens thickness, and a five-eighths-inch ball is specified for verifying impact strength. Neither does the FDA regulation mention safety frames specified in the ANSI Z87.1 standard.

Don't be misled by what employees may claim their "eye doctor" told them. To settle the argument, just insist that they bring their doctor's signed statement that the "safety glasses" in question meet or exceed all the requirements of the ANSI Z87.1 standard.

YOU MUST KNOW that your workers' eyes are adequately protected.—Code 73, BUMED. ☘

NAVAL RESERVE MEDICAL- DENTAL SEMINAR

In San Diego, Calif., the Naval Hospital and the Office of Naval Research will present a seminar: "Clinical Advances in Shock and Trauma," 23-25 April, 1973. (See Feb issue, pp 39-41) In conjunction with this, the Naval Reserve is conducting a seminar for MC, DC, MSC, and NC Reserve officers, on the afternoon and evening of 25 April. This will cover a wide variety of subjects of interest to Reserve officers.

For a registration form and information write:

CAPT H.G. Kellogg, MC, USNR-R
CO NR Medical Company 11-6
3404 Cromwell Place
San Diego, Calif. 92116

The Shock and Trauma meeting has been approved for reserve retirement point credit. Eligible individuals participating in Reserve portion of the program may certify their attendance to their unit commanding officer for recording on the unit RUPPERT as a nonpay drill. Officers not attached to a unit shall certify their attendance to the Officer-In-Charge, Naval Officer Records Support Activity, Omaha, Neb.—Code 36A, BUMED. ☘

TOPICS FROM THE TROPICS

There has been a recent outbreak of cutaneous leishmaniasis among U.S. Marines who had undergone jungle warfare training in Feb 1972 on the Atlantic side of the Isthmus of Panama in the Canal Zone.* These cases were diagnosed several months later at the Camp Lejeune Naval Hospital in North Carolina. In and around the training area there has also been a recent significant increase of reported cases in both the local military and civilian populations.

An additional group of Marines from Camp Pendleton received training in the same area during May and June and it is expected that more will undergo maneuvers there periodically in the future.

CDR R.R. Palumbo, MC, USN and CDR R.J. Kinney, MC, USN have constructively directed attention to the problem by their timely article which appears elsewhere in this issue of NAV MED.

With all the informative material and wealth of expertise that exist in our NAMRUs and EPMUs, it is hoped that Drs. Palumbo and Kinney have started the ball rolling. How about more topics from the tropics?

*U.S. Department of Health, Education and Welfare (HEW) Center of Disease Control: Morbidity and Mortality Weekly Report. Vol 21, No 26, 1 Jul 1972, pp 222-223. ☘

NAVY WORKSHOP IN OCCUPATIONAL HEALTH, INDUSTRIAL HYGIENE AND SAFETY

The Navy Industrial Environmental Health Center, in conjunction with the Bureau of Medicine and Surgery sponsored a work shop in industrial environmental health in New Orleans, La., 8-12 Jan 1973.

Ninety attendees included physicians, nurses, industrial hygienists, safety officers and other health professionals from Navy installations and government agencies across the country. The main focus of the program was to insure that all personnel involved in occupational health and safety within the Navy remain well versed in all new approaches and procedures within the fields of occupational and environmental health.

Of special interest were the changes to be brought about by BUMED's regionalization program. The impact and implementation of changes required, under the Occupational Safety and Health Act, were also addressed.

Among the 31 speakers were an outstanding array of well known authorities in the various disciplines of occupational health. Presenting the keynote speeches were CAPT C.V. Limerick Jr., Military Assistant to



RADM Alene B. Duerk, NC, USN delivers keynote address to attendees of Navy Workshop.

Deputy Undersecretary of the Navy; CDR Joseph Grimes, MSC, USN; RADM Alene B. Duerk, Director of the Navy Nurse Corps; and CAPT G.M. Lawton, MC, USN, director of the Industrial Environmental Health Division, BUMED.

The audience participated in several panel discussions which proved to be of great value in bringing out divergent viewpoints on specific problems. Dr. Dukes-Dobos and LCDR A.R. Dasler, MSC, USN, who have worked extensively on heat stress, paneled a discussion that reflected the divergent viewpoints in monitoring and preventing heat stress. The panels on carbon monoxide, asbestos and noise were enlightening, and addressed both theory and practical application of the occupational aspects.

Among the many excellent technical presentations were those given by: Paul L. Michael, Ph.D., on noise; Richard D. Stewart, M.D., on carbon monoxide; Irving J. Selikoff, M.D., on asbestos; and Joseph J. Novak, M.D., on sight conservation and ocular emergencies.

The workshop was the 14th in the series sponsored by the Center, and was the first in which sessions for medical personnel were held concurrently with other sessions for the safety/industrial hygiene group. The program was approved for 29 elective hours by the American Academy of Family Physicians.



CAPT George M. Lawton, MC, USN welcomes attendees to Workshop.



CDR C.J. Limerick, Jr., USN: "Navy Environmental Protection Plan."



CDR Samuel A. Barboo, MSC, USN delivers an address on OSHA and its impact on the Navy.

The workshop proved to be of great value to those who attended, and plans are underway for another to be held in San Francisco next November. Those who desire advance information, when this becomes available, may submit requests to: Officer-In-Charge, Navy Industrial Environmental Health Center, 3333 Vine St., Cincinnati, Ohio, 45220. ☎

THE BENJAMIN TENNEY FUND

In honor of Dr. Benjamin Tenney who was a greatly admired Rear Admiral in the Naval Reserve, Medical Corps (now retired), a permanent fund is being established, the income of which will be used to further Dr. Tenney's life-long interests in teaching and clinical investigation, in obstetrics and gynecology.

The fund will be used to support a Visiting Professorship, or a faculty and staff position in Obstetrics and Gynecology at Boston City Hospital.

Many may desire to participate in this undertaking, particularly those who have benefited from Dr. Tenney's teaching and council while they were stationed at the Naval Hospital Boston, Chelsea. If so, please write your check payable to Harvard University

for The Benjamin Tenney Fund, and mail it to:

Dr. Maxwell Finland
Channing Laboratory
Boston City Hospital
Boston, Mass. 02118. ☎

NEW SEC DEF

On 17 Sept 1947, James Forrestal took the oath of office as the first Secretary of Defense. On the following day, the National Military Establishment came into being. It was renamed the Department of Defense two years later.

Elliot Lee Richardson was nominated as the 11th Secretary of Defense by President Nixon on 4 Jan 1973, and was confirmed by the U.S. Senate on 29 Jan.

Mr. Richardson was born in Boston, Mass., on 20 July 1920. He was graduated cum laude from Harvard College in 1941 and received his law degree, also cum laude, from Harvard Law School in 1947.

He enlisted in the U.S. Army in 1942 as a private and was a first lieutenant at the time of his honorable discharge in 1945. The Secretary served in the European Theater of Operations as a litter-bearer platoon



SECRETARY ELLIOT L. RICHARDSON. (Photo by courtesy of Ms. Anne Russell, Editor, HEW Newsletter.)

leader with the 4th Infantry Division and landed in Normandy with that Division on D-Day. Awarded the Bronze Star Medal for Heroic Service and the Purple Heart with Oak Leaf Cluster, he is also entitled to wear the Combat Medical Badge and the European Theater ribbon with arrowhead and five battle stars.

He was law clerk for Supreme Court Justice Felix Frankfurter in 1948-1949, and served in Washington, D.C., as assistant to Massachusetts' Senator Saltonstall (Chairman of the Senate Armed Services Committee) in 1953 and 1954. By appointment of President Eisenhower, he served as Assistant Secretary of Health, Education and Welfare (HEW) for Legislation from 1957 to 1959, and then as Acting Secretary of HEW from April to July 1958.

Other highlights in the Secretary's career include the following: U.S. Attorney for Massachusetts, 1959-1961; Special Assistant to the Attorney General of the U.S., in 1961; Lieutenant Governor of Massachusetts, elected in 1964; Attorney General of Massachusetts, elected in 1966; Under Secretary of State, Jan 1969-Jun 1970; and Secretary of HEW, Jun 1970-Jan 1973.

The author of numerous articles on law and public policy, Secretary Richardson has received honorary degrees from: Massachusetts College of Optometry, Springfield College, Emerson College, the University of New Hampshire, Lowell Technological Institute, Harvard University, the University of Pittsburgh, Yeshiva University, Brandeis University, Ohio State University,



HONORED BY AHA.—Secretary Richardson (right) was awarded the American Heart Association's Distinguished Service Award in Jan 1973, for his "leadership and efforts to improve the health of the nation" during his tenure as HEW Secretary. J. Willis Hearst (left), immediate past president of the AHA, presented the plaque. (Photo by courtesy of Editor, HEW Newsletter.)

Lincoln University, Temple University, Whittier College and Michigan State University. He is a member of numerous societies and organizations, including the American Law Institute, the American Bar Foundation, the Council on Foreign Relations and the American Academy of Arts and Sciences.

There can be no doubt about it. The Department of Defense remains in excellent hands. 🇺🇸

RADM McClellan Visits Medical Center

RADM Thomas R. McClellan, Commander Naval Air Systems Command, recently visited the Naval Aerospace and Regional Medical Center, Pensacola, Fla. Researchers discussed investigations related to flight crews with Admiral McClellan.

SIGN IN PLEASE.—RADM Oscar Gray Jr., MC, USN, CO, Naval Aerospace and Regional Medical Center, Pensacola, invites RADM T.R. McClellan to sign the guest register.—PAO, Nav Aerospace & Reg Med Center, Pensacola, Fla. 🇺🇸



POST REDEPLOYMENT MEDICAL SUPPORT

The U.S. Embassy has concluded a contractual agreement with the Seventh Day Adventist Organization in coordination with the Loma Linda University School of Medicine to operate the present U.S. Army Hospital in Saigon following the withdrawal of U.S. Forces from the Republic of Vietnam (RVN). This hospital will provide hospitalization and general outpatient care for all U.S. Mission USAID, DOD, and DOD-invited contractor personnel in RVN. Other U.S. civilian personnel in RVN may also utilize this facility.

The hospital will provide specialty outpatient and inpatient care in general surgery, internal medicine, obstetrics/gynecology, and pediatrics. Pathology, radiology and dental services are planned but will not be available immediately.

The hospital will operate a 24-hour ambulance service and a 24-hour emergency room for personnel requiring such services. In addition, 24-hour nursing care will be provided for inpatients. A full range of laboratory, X-ray and pharmacy services will be provided.

Free outpatient and inpatient care will be provided to all uniformed personnel of the U.S. mission. Since the medical care available at the contractor hospital is deemed adequate, DOD contractors will not establish duplicate hospital facilities at U.S. Government expense. "Air America" will operate an emergency aeromedical evacuation system throughout RVN to support all U.S. personnel.—COMUSMACV 081100Z Feb 1973. 🍀

EMERGENCY BREATHING DEVICE

The Naval Material Command has announced the development of an emergency escape breathing device, which will decrease the possibilities of smoke inhalation injuries caused by shipboard fires. The device consists of a plastic face mask and a canister of compressed air. It weighs about five pounds and is the size of a standard Navy binocular case. The device is reusable, has a long shelf life and requires little maintenance.

The devices should be stored in readily available locations around the ship. In case of fire or smoke, a

crewman would pull the plastic mask completely over his head and activate the air supply. It takes less than 20 sec. to don the breathing device.

The canister contains an eight-minute supply of breathable air, normally sufficient for crewmen to escape from any part of a ship to an open deck or other smoke-free area.

The first emergency escape breathing devices will be distributed to aircraft carriers and Fleet Training Centers in early March. Delivery to other ships is planned for the near future. 🍀

COURSE ON AUDIOMETRIC TECHNIQUES

Twenty students recently completed the course on Audiometric Techniques conducted at the Naval Aerospace Medical Institute (NAMI), Pensacola, Fla. Five Navy civilian employees were among the 20 students.

NAMI's next course for audiometric technicians will be conducted 23-27 April at NAS, North Island, San Diego, Calif.



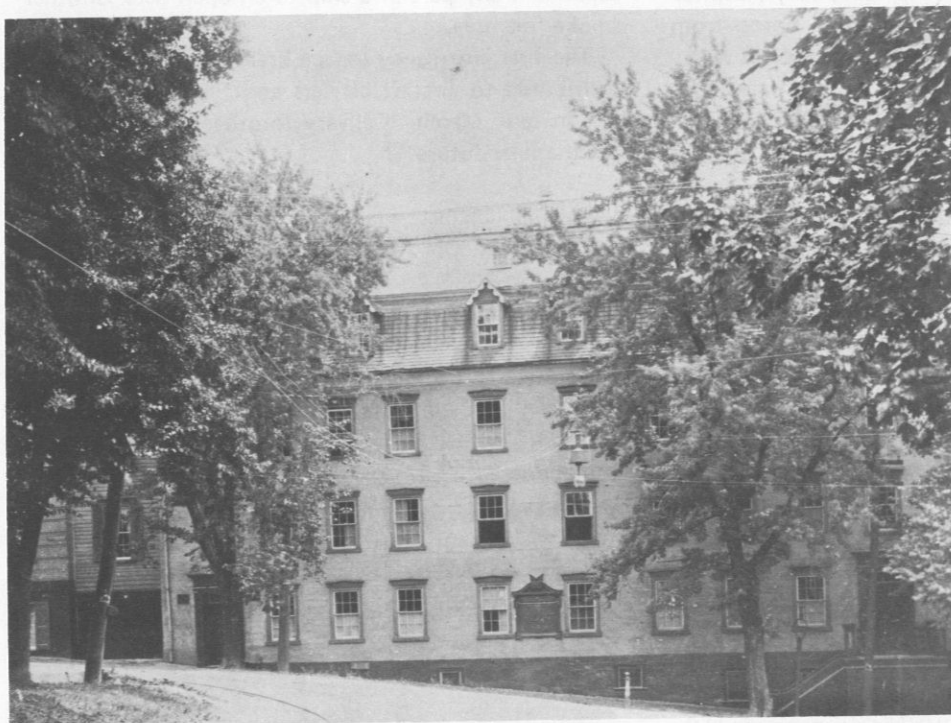
RECEIVE COURSE CERTIFICATES — CAPT Robert C. McDonough, MC, USN, CO, NAMI, presented certificates to audiometric technicians (from left to right): Lois R. Beverly, Audiology Technician, Norfolk Naval Shipyard; Yolande M. Brown, Health Technician, Naval Ordnance Station, Indian Head, Md.; and Yvonne K. Shaffer, Medical Technician, Ships Parts Control Center, Mechanicsburg, Pa.—PAO, Nav Aerospace Med Center, Pensacola, Fla. 🍀

CORPSMAN RECRUIT HONORED

Corpsman Recruit Donald G. Smith from Great Lakes, Ill., and a civilian friend were presented Chicago's Medal of Merit by Mayor Daley on 15 Feb. The two men subdued two assailants who had assaulted and disarmed a city traffic patrolman in downtown Chicago. 🍀

SUPPLEMENT TO ARTICLE APPEARING ON PAGE 11

We are indebted to Moravian College and Mr. Robert T. Brown of 2280 N. Main Street, Bethlehem, Pa., for the following two prints which arrived just as we were going to press. The illustrations should accompany Dr. Gifford's article on Dr. Joseph Harrison — America's first naval surgeon (page 11).—Ed.



Moravian Brethren's House, Church Street, Bethlehem, Pa., which was used as a hospital by the Continental Army during the Revolution. While attending the sick and injured under treatment here, Dr. Joseph Harrison died of typhus fever. (Photo by courtesy of Mr. Robert T. Brown)



The old Moravian Cemetery in Bethlehem, Pa., known as "God's Acre." It is here that Dr. Gifford believes Dr. Joseph Harrison was buried, unidentified, in "Strangers' Row" of God's Acre, the row situated nearest to Market Street. Interestingly, the grave of Dr. Aquila Wilmot, a colleague of Dr. Harrison who also died of typhus fever at the hospital during the same epidemic, is marked; it was the first grave dug in Strangers' Row. (Photo by courtesy of Mr. Robert T. Brown) ☙

UNITED STATES NAVY MEDICINE

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NOTICES should be received not later than the third day of the month preceding the desired month of publication.

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RADM ALBRITTAIN DECORATED.—The former Deputy Chief of the Bureau of Medicine & Surgery, RADM J.W. Albrittain, MC, USN (now retired) was presented the LEGION OF MERIT. Following the award ceremony, he was congratulated by the 26th Surgeon General of the Navy, VADM Donald L. Custis, MC, USN (left). Admiral Custis, at the time, was awaiting Senate confirmation of his nomination for the office of Surgeon General, and three-star rank.

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